Fiorina voice-mail lesson: It could happen to you

Opinion: Time to play hardball with vendors

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DAVID HOLLENBACH

KNOWLEDGE CENTER DATA MANAGEMENT

Taming Data Chaos

Companies accumulate a huge amount of data every day, but they can't effectively exploit it for business value unless they whip it into shape. Some highlights of our special report:

- **Data integration tools** for eliminating the Tower of Babel in corporate America.
- **How to merge** data silos and clean the data.
- **Five steps to building** a scalable database system.
- **The powerful benefits** of placing data on a map.

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ONLINE EXCLUSIVES

Here's a sampling of the additional features available at www.computerworld.com/q?k1900

- An insurer saves $2 million by replacing a blizzard of paperwork with a mobile CRM database.
- How to make your CFO happy with data analytics.

TRAVEL FIRMS BEGINNING IT COMEBACK

Projects with fast ROI, customer benefits OK'd

BY JENNIFER DiSABATINO

In the months following Sept. 11, many IT projects in the travel industry came to a screeching halt unless they involved security. New technology initiatives didn't fit into the business plans of companies that were in survival mode as a result of the terrorist attacks and the economic slowdown.

But top IT managers at a half-dozen airlines and other travel businesses now say their companies are making exceptions. Some quick and relatively inexpensive IT projects are getting the green light from senior management as long as they promise a rapid return on investment or have a direct effect on customer-facing systems, these users said.

For example, Curtis Robb, president and CEO of Delta Technology Inc., said parent company Delta Air Lines Inc.

IT Comeback, page 69

EARLY ADOPTERS: .NET TOOLS READY

They say key challenge is learning framework

BY CAROL SLIWA
NEW ORLEANS

Getting their arms around Microsoft Corp.'s new .Net development framework, with hopes of salvaging their existing Visual Basic and C++ code, was a central focus for many corporate users attending last week's TechEd 2002 conference here.

The few early .Net adopters that Microsoft spotlighted not only dismissed any notion that the new tools, languages and framework aren't ready to use; they also said they don't want to go back to their old programming environments. But they cautioned developers that their greatest learning hurdle may lie in the 6,500 class libraries in the .Net framework.

"It's big," warned Brad Sewell, an assistant vice president in IT at Pacific Life Insurance Co. "But if you were developing on a Microsoft platform before, the learning curve is not that steep."

Some developers expressed concerns about adjusting to .Net's greater object-oriented

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Computerworld is asking IT customers — companies that use technology but don't produce or sell it — to nominate IT vendors that offer products or services that provide measurable business value.
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KNOWLEDGE CENTER: DATA MANAGEMENT

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ILLUSTRATIONS BY DAVID HOLSINBACH

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THE DAWN OF A NEW DATABASE

The demand for warp-speed response times from thousands of users may require a new type of database, says one observer.
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KEEPING THE CFO HAPPY

An expert on financial analytics explains how CIOs can meet the demanding data needs of chief financial officers and global finance teams. (Hint: Speedy response times would be good.)
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DATA MANAGEMENT CASE STUDIES

How various technologies — from data warehouse extranets to "active archiving" — are being exploited in the retail and transportation industries.
www.computerworld.com/q?28040

AT DEADLINE

EMC Files Patent Suit Against Hitachi Data

EMC Corp. filed a lawsuit in U.S. District Court accusing rival Hitachi Data Systems Corp. and parent company Hitachi Ltd. of infringing on six of its storage management patents. Hopkinton, Mass.-based EMC also asked the U.S. International Trade Commission to block Santa Clara, Calif.-based HDS from importing several software products. Hitachi officials declined to comment about the suit.

CA Board Stands By Its Top Executives

Computer Associates International Inc.'s board rebuffed a call for the ouster of the Islandia, N.Y.-based company's chairman, CEO and chief financial officer, in a response to a letter that was sent to CA shareholders last month by Dallas-based investment firm Ranger Governance Ltd., CA's eight outside directors said the three executives "continue to enjoy our full confidence."

Medical Firm Names New Technology Chief

Ranger Orthopedic Group Inc., a Bethesda, Md.-based medical services firm that had revenue of just over $500 million last year, named Edward Mitzel as its CIO. Mitzel, who will report to Ranger's president and chief operating officer, worked previously as director of IT at Provident Mutual Life Insurance Co. in Berwyn, Pa.

Microsoft Changes Part of .Net Plan

Microsoft Corp. said it's recasting a key piece of its .Net strategy under which it planned to work with corporate partners to develop online consumer services that Microsoft would host. Companies using .Net My Services will now be able to manage the technology themselves.

Voice-Mail Systems Easy Prey for Hackers

Fiorina incident is 'wake-up call' about lack of security for phone messages

BY BRIAN SULLIVAN

SECURITY consultants aren't surprised that someone managed to take a voice mail that Hewlett-Packard Co. Chairwoman and CEO Carly Fiorina left for HP Chief Financial Officer Robert Wayman last month and transmit it to the world.

Voice-mail systems and phone rooms tend to have less security than other sensitive areas at companies, and the four-digit personal identification numbers used to guard access to users' messages can be easily cracked.

"My guess is that this info was obtained simply by guessing [Wayman's] password," said Todd Tucker, director of security and architecture at PentaSafe Security Technologies Inc. in Houston.

The *San Jose Mercury News* said it received the voice-mail message, in which Fiorina told Wayman she was worried about the outcome of the March 19 proxy vote on the HP/Compaq Computer Corp. merger, from an anonymous caller. HP has had little to say about the incident except that the message was genuine and that it takes the dissemination of private company communications quite seriously.

Lesson Learned

But Tucker and other security experts said HP has learned a lesson that all companies should take to heart.

"I think the biggest thing is that we continue to have wake-up calls on how security and privacy needs to be addressed, and this is definitely a wake-up call," said Rick Shaw, president of CorpNet Security Inc. in Lincoln, Neb. "Companies do not always cover their voice-mail systems with the same critical level that they would with the networks. The bottom line is, ever since we started digitizing voice mail, it is just another file sitting on a server."

FIORINA voiced concern about merger in stolen message.

As a result, Shaw said, anyone who can access the voice-mail server can listen to whatever messages are there. He said it isn't "that difficult" to look around on voice-mail servers and poke into different files to see what's vulnerable.

If an intruder finds something interesting, then downloading that information and spreading it to the rest of the world is even easier, Shaw said.

Another way that companies leave themselves vulnerable is by using systems right out of the box without configuring them for added security, said David Losen, director of secure systems at Sergeant Laboratories Inc. in La Crosse, Wis.

"If you do it right out of the box and think you are good to go, then you probably aren't," Losen said. He noted that security also depends on what kind of systems companies use for voice mail, because some systems are left wide open to possible attacks.

People tend to forget about security when they send e-mail messages or leave voice-mail messages containing sensitive data, he explained.

"They are unaware of the potential impact to either them or their company and underestimate the threat," Tucker said. "I doubt Carly Fiorina would have expected this kind of a backlash just from leaving a voice mail with someone."

On the other side of the equation is the fact that people can overestimate security measures that their colleagues, contractors and customers have put in place and believe that those measures are as good as or better than their own.

"You have to be extremely careful when sharing information with any other person or party, because you never know what level of security they have over their information," Tucker said.

Quick Link HP says the leaked voice mail won't hurt its defense against Hewlett heir's lawsuit
www.computerworld.com/q/726871

Wall Street Firms Team Up On Shared Messaging System

BY JENNIFER OBASATINO

Eight of the top financial services firms in the U.S. last week said they have set up a shared system that's designed to let them communicate securely with corporate clients via instant messaging (IM).

The deployment is the second multienterprise IM system to be rolled out in recent months, following a project in which the U.S. Navy created an IM network with the British, Canadian, German and Australian navies.

The Wall Street firms' system, which is based on IM software developed by Communicator Inc. in White Plains, N.Y., connects 30,000 workers at the eight participating companies to clients at 2,000 institutional money management firms.

The companies, which declined to disclose the cost of the project, said the IM system provides a secure way to share information in real time and still adhere to Securities and Exchange Commission guidelines on information security and data archiving.

Closed Community

Communicator's Hub IM software includes a federated directory and address book that accepts users only from the corporate directories of the eight firms. That makes the shared system a closed community, and all information is transferred in HTTP over Secure Sockets Layer protocols.

Hub IM handles user authentication and security, said Dexter Senft, managing director of IT for the fixed-income e-commerce group at Lehman Brothers Inc. in New York, one of the eight participating firms. Message archiving is something "that we have worked out ourselves" on an individual basis, he added. Lehman worked with Communicator to develop a custom archiving tool, Senft said.

The IM system is also being used by Credit Suisse First Boston Corp., The Goldman Sachs Group Inc., J.P. Morgan Chase & Co., Merrill Lynch & Co., Morgan Stanley Dean Witter & Co., Salomon Smith Barney Holdings Inc. and UBS Warburg LLC.

Two years ago, six of the firms set up a consortium with Communicator to create an Internet portal that links their individual Web sites and publishes research information and price quotations for buyers of fixed-income bonds.

The SecuritiesHub LLC portal, which is managed by Communicator, is now the channel through which brokers and their corporate clients can share information via IM.

Conciliatory Oracle Tries to Cozy Up to Apps Customers

Hopes softer touch, help with upgrades will ease 11i doubts

BY MARC L. SONGINI
SAN DIEGO

Looking to overcome upgrade issues and other problems that have soured relations with some of its business applicatioo users, Oracle Corp. last week tried to take a more conciliatory approach at its AppsWorld conference here.

For example, Oracle CEO Larry Ellison acknowledged that the company's E-Business Suite 11i software is difficult to install and expressed a willingness on the company's part to work more closely with users to help them succeed in rolling it out. "You know, we've just got to admit the fact that it's not easy," he told attendees.

Oracle also announced several new upgrade-related programs in an attempt to make good on Ellison's promises (see box). And the company said it would avoid major new releases of the applications in favor of a more incremental approach to adding functionality (see "No Major Oracle Upgrades on The Horizon" at right).

Some Users Optimistic

Oracle's friendlier message played well with some users.

"We're optimistic, looking at positive improvemeots in our relationship with Oracle," said Tom Wyatt, president of the independent Oracle Applications Users Group in Atlanta. Wyatt is also director of Oracle systems at Sitel Corp., a Baltimore-based customer service outsourcing firm that plans to upgrade to 11i next year.

But other users noted that Oracle still has to deal with lingering issues in areas such as software pricing, functionality and technical support.

Perry Cozzone, CIO at Berwind Pharmaceutical Services Inc., a West Point, Pa.-based maker of coatings for medical tablets, said he wants Oracle to offer concurrent user pricing on 11i as an alternative to its named user licenses.

The named user approach requires that a license be bought for each worker who uses the software. Cozzone said Berwind could save money if concurrent user pricing, which lets users share licenses, were an option. "Oracle has to take a closer look at pricing," he said.

Steven Yasbek, CIO at Paradigm Wireless Systems Inc., said the 11i order management module still doeso't provide the detailed reporting features that end users at the Irvine, Calif.-based maker of power amplifiers would like to see.

But Yasbek added that Paradigm, which outsources management of its applications to Oracle, doesn't want to customize the software for fear that data could get corrupted during the process.

In fact, Ellison and other Oracle officials have repeatedly urged users to avoid customizations. But Ellison acknowledged last week that 11i can't support every required functioo and said that companies could use Java and XML to develop extensions without changing the underlying code.

Oracle claimed that its named user pricing is consistent with what its rivals offer and said that the 11i applications are fully stable. But it said that less than 40% of its users have installed 11i or are in the process of doing so.

Jennifer Kemmeter, an analyst at Boston-based AMR Research Inc., said Oracle still faces an uphill battle to get holdout users to upgrade. "There is indeed a perception problem on the user side that Oracle is not delivering what the company promised with 11i," Kemmeter said.

Can We Help?

Oracle announced the following programs aimed at easing upgrades to its 11i applications:

- **A fee-based upgrade outsourcing service** under which it will handle migrations to the software for users.
- **A free upgrade assistance program** within its support organization that will provide help to users.
- **A role-based training program** for members of project teams, designed to speed the upgrade process.

No Major Oracle Upgrades on The Horizon

SAN DIEGO

Oracle, which is still struggling to persuade many of its business application users to upgrade to its 2-year-old E-Business Suite 11i technology, last week said it has no plans to roll out another major release in the foreseeable future.

Oracle executives had talked about plans for a follow-on release as long as three years ago, but the company said at the AppsWorld conference that 11i has enough functionality to eliminate the need for a complete new version. It now plans to upgrade 11i on a more incremental basis, adding features every four or five months.

William Lawson, CIO at industrial goods manufacturer Ametek Inc. in Paoli, Pa., said Oracle's upgrade road map is acceptable as long as the software vendor handles the incremental releases properly.

"The [11i] suite is pretty rich, and we can't begin to leverage what's already there," Lawson said. Ametek hasn't fully upgraded to 11i yet, he added. The company is running multiple versions of Oracle's applications in different business units, including the 10.7 and 11.0.3 releases.

But Tim Butler, CIO at vitamin maker Nature's Life in Garden Grove, Calif., said Oracle will have to include all of the required software patches in 11i updates to make the incremental upgrade approach work. That way, users will be able to keep their applications up-to-date on functionality and ensure backward compatibility with earlier releases, said Butler, who's on the board of the independent Oracle Applications Users Group.

David Dobrin, an analyst at B2B Analysts in Cambridge, Mass., said 11i "is still a long way from achieving what [Oracle is] promising." For example, the company is still working to integrate various modules in the suite, he said.

– *Marc L. Songini*

IBM Midrange Users Face New IT Issues

Server consolidation, tying apps to Web top the agenda at Common conference

BY JAIKUMAR VIJAYAN

More than 3,000 users of IBM's venerable iSeries midrange systems — formerly known as the AS/400 — will gather in Nashville this week for the biannual Common trade show.

Key areas of interest are likely to be server consolidation, Web-enabling of existing applications, support for Unix oo iSeries servers and the upcoming release of a new version of the OS/400 operating system.

"Judging from the number of sessions on [logical partitioning], server consolidatioo is clearly one of the main interest areas," said Charlie Massoglia, president of Common, the Chicago-based user group of IBM's midrange systems. "The immediate payback in terms of savings on cost and management" is driving much of that interest, he said.

IBM's perceived lack of marketing of the iSeries, which has been a long-standing complaint among some users, is sure to be high on the agenda as well, said Al Barsa, president of Barsa Consulting Group LLC, a Purchase N.Y.-based iSeries consulting firm.

> For iSeries users, there are just two types of computers ... iSeries and inferior computers.
>
> AL BARSA, PRESIDENT, BARSA CONSULTING GROUP

"For iSeries users, there are just two types of computers in the world: the iSeries and inferior computers," Barsa said. "Most people are upset that IBM isn't doing enough to tell the world about it."

At the same time, user satisfactioo with IBM's iSeries technology remains high, he said. "They are bringing in all of the competitive features that other platforms are introducing and, in many cases, are actually leading [more popular] platforms," Barsa said.

This is especially true of the support for logical partitions that IBM introduced on the iSeries about two years ago, Massoglia said. As the technology has matured, it has helped users cut costs by hosting multiple workloads on a single server, he said.

The iSeries support for multiple operating environments — including Linux, Windows and soon AIX Unix in a single partition — is also boosting its popularity within IBM's installed base and with first-time buyers, Massoglia said.

Midrange Server Battle Benefits Users

Sun and IBM offer dueling products, lower prices in scrap for market share

BY JAIKUMAR VIJAYAN

THE FEROCIOUS rivalry between Sun Microsystems Inc. and IBM continues to yield big benefits for users.

Last week, both vendors introduced Unix servers bristling with high-end features but bearing midrange price tags.

IBM's p670 is a smaller clone of the company's high-end p690 server. With support for up to 16 processors and 128GB of memory, the new server is roughly half the size of the p690. But the p670 includes all the features available in the premium product, soch as virtual partitioning and self-repair capabilities. At $175,000, IBM's new servers start at less than half the price of an entry-level p690.

SUN'S SUN FIRE 12K SUPPORTS:
- Up to nine hot-swappable, interchangeable CPU/memory boards for dynamic resource provisioning
- Up to 52 900-MHz UltraSPARC III chips
- Up to 288GB of memory
- Up to nine dynamically reconfigurable system domains (partitions)

IBM'S P670 SUPPORTS:
- Up to 16 1.1-GHz Power4 processors
- Up to 16 logical partitions
- Up to 128GB of memory
- Service processor, dynamic processor, memory de-allocation functions and Chipkill memory for greater uptime

Sun's new Sun Fire 12K product borrows heavily from its flagship Sun Fire 15K product, which it introduced last year. The server, which starts at about $500,000, supports up to 52 processors, nine partitions and 288GB of memory and comes with the same high-availability and reliability features found oo the 15K.

Sun also dropped prices by as much as 41% across its entire line of UltraSPARC III-based servers.

The product annooocements and pricing moves are as much about generating new sales in a tight economy as they are about the fierce hattle for market sbare betweeo the two vendors, said Richard Partridge, an analyst at Port Chester, N.Y.-based D.H. Brown Associates Inc.

Playing Catch-up

During the past year in particular, IBM has beeo aggressively challenging Sun's Unix market domination. In overall annual sales, Sun still handily leads IBM in every single Unix market in which both companies compete, according to the latest market figures from IDC in Framingham, Mass.

But IBM is catching up. For instance, in the fourth quarter of last year, IBM for the first time in several years overtook Sun in Unix server revenue, said Jean Bozman, an IDC analyst.

"IBM and Sun are clearly at each other's throats and are trying to win share from eacb other," Partridge said.

"I think it's fairly clear that the vendors are hungry for business and are interested in working with us to create a flexible relationship," agreed David Rymal, director of technology at Everett, Wash.-based Providence Health System.

The hospital group, which uses servers from both Hewlett-Packard Co. and IBM, is currently planning to purchase IBM's new p670 system to augment the two p690s it has already installed to run an enterprise resource planning application. What makes the p670 appealing is its high-end functionality and processors at a midrange price, Rymal said.

On the other hand, The Weather Channel Enterprises Inc. in Atlanta is considering Sun's new 12K server because it offers significaotly greater scalability than the current Sun 6800 server, at a reasonable price, said Bill Watson, manager of systems administration at the Weather Channel.

"Going directly to the 15K [from Sun's 6800 server] is a leap for a lot of customers," be said. "The 12K gives you a sort of entry point to get there."

Watch manufacturer Fossil Inc. in Richardson, Texas, which uses other IBM products, is coosidering IBM's p670 server because it comes packed with features that have already been proved in the high-end space, said CIO Ed Jurica. But a final decision hasn't yet been made, he said.

"We haven't finished our conversatioo yet," Jurica said. "Everyone is being aggressively competitive."

Not to be left behind, Compaq Computer Corp. last week released to select customers some preview models of new Alpha servers based on the forthcoming Alpha EV7 processor technology. The first systems, which will support up to eight processors, will be available by year's end, and larger systems capable of scaling up to 64 processors are due out next year.

Tivoli Simplifies Service-Level Monitoring

Software fuses network, systems management tools

BY MICHAEL MEEHAN

IBM's Tivoli software line is about to get simpler — and it's none too soon for users who have to monitor multiple points of failure in both networks and systems to assure applicatioo service levels.

That's the case for David Hamilton, director of telecommunications and technical services at Sutter Health Inc. in Sacramento, Calif., who is struggling to maintain service levels while using multiple, complex monitoring systems.

"It's much more difficult to do that work since we started using [Tivoli in 1998]," be said. "The tools had to get better, and they have to keep getting better."

The new Tivoli monitoring and management tools, to be released this month, include new predictive capabilities, data warehousing functions, a Layer 2 switch analyzer and root-cause analysis tools. They also mark a major effort by IBM to fuse network and systems management into a sensible whole.

Up and Coming

What Tivoli plans to release over the next month:

Service Level Advisor Predicts outages and measures how well applications perform from an end-user perspective.

Enterprise Data Warehouse Uses IBM DB2 technology to archive monitoring data; comes with all Tivoli products.

Directory Server 4.1 Comes with all Tivoli products; adds security and authentication.

Switch Analyzer Extends Tivoli product line into data-link layer (Layer 2) functions.

Enterprise Console Integration with NetView Allows users to perform multilayer root-cause analysis.

"A lot of what we're trying to do is offer a simpler product line," said Carl Kessler, vice president for Tivoli products.

Users and analysts agreed that simplicity was needed.

"For a long time, [Tivoli developers] weren't availing themselves of the tremendous resources of IBM, and they were putting out too many products that didn't fit together," said Valerie O'Connell, an analyst at Aberdeen Group Inc. in Boston.

Hamilton said he doesn't have the budget to scrap existing systems in order to use new monitoring products.

As a beta site for Tivoli's new Service Level Advisor product, Sutter Health needed to draw information from its Hewlett-Packard Co. OpenView network monitoring system, import it into the Tivoli Enterprise Console for systems management and theo have that feed the data to the Service Level Advisor.

Hamilton said the upgrade does this process, helping him keep a sharper eye on overall performance and availability of applications. "What I care about is if I'm trending toward a missed service level," he said. "That allows me to fix outages before they occur."

Tim Grieser, an analyst at IDC in Framingham, Mass., said he believes the service level performance tools could add a compelling new offering to Tivoli's availability aod event management roots.

"Everyone's trying to get to that next abstraction of how systems function from an end-user point of view," he said.

Quick Link For more on Tivoli's root-cause analysis tools, visit our Web site.
www.computerworld.com/q?2290

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BRIEFS

SEC Starts, Stops Inquiry Into IBM

The Securities and Exchange Commission (SEC) confirmed reports that it recently opened a preliminary inquiry into IBM's accounting practices but said it closed the matter without taking any action. The SEC didn't release further details, and IBM declined to comment. IBM last week warned of lower-than-expected results for the first quarter (see story, page 20).

Corrupted Files Cause Outage on eBay's Site

Online auction firm eBay Inc. said its Web site was hit by several outages, including one that shut down parts of the site for about 12 hours. San Jose-based eBay said the glitch was caused by corrupted data files that replicated themselves and then spread across its servers. The company was still investigating the cause of two shorter outages that also affected some users of its site.

UPS to Shut Down E-Delivery Service

United Parcel Service Inc. disclosed that it will discontinue its electronic document delivery service effective Sept. 1. Atlanta-based UPS has offered the OnLine Courier service for the past four years, but analysts said the document exchange technology didn't pay off for the company. The U.S. Postal Service said it recently dropped a similar service.

Short Takes

IBM said it plans to ship an upgrade of its WebSphere Portal software by the end of next month and will add support for its mainframe and midrange servers later in the year. . . . Bedford, Mass.-based RSA SECURITY INC. reported a first-quarter net loss of $13.7 million and said its revenue totaled $55.5 million, down from the year-earlier level of $70.3 million.

UPS Deal to Replace Drivers' Handhelds

Firm opts for Windows CE over Pocket PC

BY BOB BREWIN

UNITED PARCEL Service Inc. has signed a major contract for the next-generation handheld computer and wireless communicator to be used by its drivers. Analysts valued the deal with Symbol Technologies Inc. at $50 million to $100 million.

Atlanta-based UPS declined to provide details on the new Driver Information Acquisition Device, except to say that it will run on Microsoft Corp.'s Windows CE operating system. Holtsville, N.Y.-based Symbol was also reticent, citing a confidentiality agreement with UPS.

Last month, Memphis-based rival FedEx Corp. said it had selected Microsoft's Pocket PC as the platform for the PowerPad, its next-generation handheld system for drivers.

Ethan Cohen, research director at Aberdeen Group Inc. in Boston, speculated that the new UPS device could include a variety of wireless connectivity options, including support for wide-area packet-data networks, Wi-Fi wireless LANs and possibly Bluetooth short-range wireless connectivity — all technologies that FedEx is considering as well.

Craig Mathias, an analyst at Farpoint Group in Ashland, Mass., called the UPS decision to use a Microsoft operating system instead of Palm Inc.'s Palm OS an example of how "Windows CE is going to beat Palm" in the enterprise environment. Mathias said enterprise users are increasingly choosing either Windows CE or Pocket PC because those operating systems are "more tightly coupled with the Microsoft desktop," which predominates in corporate IT environments.

Jason Hertzberg, director of competitive analysis at Santa Clara, Calif.-based Palm, disputed that analysis. "I have a half-dozen major transportation wins," he said.

Palm Fights for Market

Hertzberg added that Palm has regained its share of the commercial reseller market since October, when Microsoft introduced its enterprise-focused Pocket PC 2002. At that time, Palm's share had dipped to 40% of the commercial reseller market, but since then, it has climbed back up to more than 60%, according to The NPD Group Inc., a research firm in Port Washington, N.Y.

Cohen said he found UPS's selection of Windows CE over the more feature-rich Pocket PC operating system "an interesting choice," considering Microsoft's push to move mobile users to the Pocket PC. "Evidently, Windows CE is robust enough to support their applications," he said.

JUST THE FACTS

Driver Devices

- **Contract with Symbol Technologies** is valued at $50 million to $100 million.
- **Rollout is planned** for 2004.
- **Based on Microsoft Windows CE;** rival FedEx is building its device around Microsoft's Pocket PC operating system.
- **Analysts expect the new device** to incorporate wireless connectivity technologies including wide-area packet radio, wireless LAN support and possibly Bluetooth short-range communications.

Quick Link: Visit our Mobile/Wireless Knowledge Center for more about handhelds. www.computerworld.com/q/fh1000

BT Group Plans 4,000-Node Public-Access Wi-Fi Net

Rivals likely to roll out more networks

BY BOB BREWIN

BT Group PLC last week said it plans to install 4,000 public-access wireless LAN nodes designed to serve mobile enterprise users throughout the U.K. Analysts described the plan, expected to be completed in 2005, as one of the largest wireless LAN initiatives to date.

Global mobile telecommunications access providers predicted that the BT launch will be followed by announcements of rival public-access wireless LAN networks in the U.K. that will be equal in scope.

London-based BT Group plans to focus its high-speed (11M bit/sec.) public-access 802.11b, or Wi-Fi, wireless LAN business on mobile enterprise users. According to a company spokeswoman, BT's goal is to sell the service to companies with large pools of users.

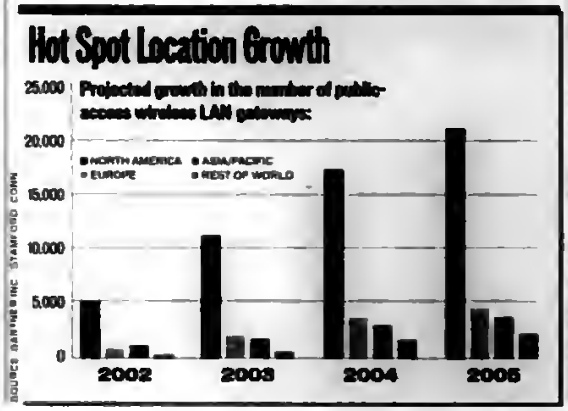
Pierre Danon, CEO of BT Retail, said in a statement last week that BT intends to serve "key public sites," including railway stations, hotels and airports. He said the firm is in "discussions with all the leading retailers and property owners to create the right geography and numbers of outlets."

John Rasmus, vice president of business development at GRIC Communications Inc., a wired and wireless access aggregator and provider in Milpitas, Calif., said the BT announcement indicates that the U.K.'s Radio Communications Agency (RCA) will soon make a decision to allow commercial use of the 2.4-GHz spectrum used by 802.11b wireless LANs.

Last month, an outside review commissioned by the U.K. Department of Trade and Industry recommended dropping restrictions against commercial use of that spectrum.

Once that prohibition is lifted, Rasmus predicted, "the floodgates will open" to deployment of public-access wireless LANs in the U.K. He said that based on his conversations with potential partners, once the RCA lifts the commercial ban, several providers will announce public-access wireless LANs equal in size to the BT Group system.

BT Group said it will provide details on pricing and its rollout plans in June.



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ING Consolidates Web Sites, Integrates Back-End Databases

Financial services firm looks to boost functionality for its online customers

BY LUCAS MEARIAN

IN ADDITION TO a multimillion-dollar television advertising campaign that it launched last year, ING Americas is trying to buttress its online branding by consolidating scores of Web sites into a few sites that have a common appearance and increased functionality.

ING Americas has acquired about a dozen financial services companies in the past few years, including Pilgrim Funds, Aetna Financial Services and ReliaStar Financial Corp. Those acquisitions have left the Atlanta-based insurance and banking firm with 40 to 50 Web sites offering different services. But very few of them are cross-linked, and most have "no real functionality to speak of," said Tom Daly, vice president of Web strategy at ING Americas.

A Competitive Edge

ING's consolidation effort is part of a trend among financial services firms to revamp their Web platforms with broader services, said Shaw Lively, an analyst at IDC in Framingham, Mass. Because of increased competition, financial services firms will be in a rush to build up their online branding images and consolidate technology features from recent acquisitions in the next two years, Lively said.

ING Americas, which has business operations in the U.S., Canada, Mexico, Argentina, Brazil and Chile, wants someone logging on in Buenos Aires to have the same Web site experience as someone in New York does, said Lively.

Before a revamping effort that began in April 2001, ING's Web sites performed so slowly that users were being turned off.

"We were losing three people to every five who logged on, and very few of those who stayed on the site went on to do anything significant," Daly said.

ING hired Cambridge, Mass.-based technology consultancy Sapient Corp. to use HTML code to link different sites with newly created, enterprisewide templates. ING paid less than $1 million for that work, but Daly said it will cost additional millions of dollars to tie together the company's back-end systems and databases so customers can access multiple accounts online using a single sign-on feature.

The first phase of the project, which was aimed at providing a more consistent and clean look for the sites, was completed last September, according to Daly. The second phase is expected to be done next week, and the project should be finished by year's end.

ING'S DALY: "We were losing three people to every five who logged on."

The new sites will provide customers with greater account access features, content tools, financial calculators, agent search features and investment advice through e-mail and newsletters. The integration of ING's databases should also create greater efficiencies, with less or no manual data entry needed.

Daly said ING can reuse the Web templates it created for this project when it works with third-party companies to design Web sites in the future, providing an enormous cost savings and part of the return on investment for the project.

He acknowledged that while the new sites have a more consistent appearance, improved navigation features and clean HTML code, they still lack rudimentary features such as account access and fund transfer capabilities. Those will come when the back-end piece of the project is completed.

AT A GLANCE

Unite-ING

By consolidating Web sites and tying back-end systems, ING hopes to do the following:

- Increase data throughput rates
- Make navigation of its sites simpler
- Speed the download of information
- Provide customers and agents greater access to enterprisewide data
- Reuse its Web site templates and development processes for future projects

Insurers Use IT to Fight Brokerage, Bank Rivals

Escalating competition prompts new IT strategies as firms try to do more with less

BY LUCAS MEARIAN
FORT LAUDERDALE, FLA.

IT executives from some of the largest insurance firms in the U.S. are using new technology strategies to combat increasing competition from banks and brokerages.

For example, Mike Lechtenberger, first vice president of information systems applications at Mutual of Omaha Insurance Co., said at last week's LOMA Systems Forum here on financial services technology that as IT budgets shrink, the pressure to do more with less increases. Thus, he said, solid cost-benefit analysis can make or break project funding.

Mutual of Omaha has immature interactive voice response (IVR) and online sales channels that account for less than 10% of its revenue. Lechtenberger hopes to soon boost IVR and online sales with more robust technology so that they make up 40% and 10% of sales, respectively.

To help make a business case for an increased investment in IVR technology, Lechtenberger is using a simple Excel spreadsheet to measure how much it costs the Omaha-based firm to sell its products through customer service representatives vs. automated IVR and online systems. He then compares the data against industry averages for IVR technology use.

An Alternative Approach

Eric Miller, senior principal partner at Toronto-based HighPoint Consulting Inc., which was hired by Mutual of Omaha to develop the cost-benefit model, said it's all about "cost avoidance" and reducing the insurer's customer service representative head count.

Swiss Reinsurance America (Swiss Re) has taken a different approach to improving its competitive position. The Armonk, N.Y.-based reinsurance company recently outsourced a large Web portal project that will let client insurance firms underwrite policies online.

The service, called e-Reassure, has taken about 18 months to build and will qualify customers for policies immediately by having them answer a 14-question online application that's processed electronically.

Gaining Success

LOMA attendees said weighing multiple IT spending scenarios here means they should:

- **IDENTIFY AND PURSUE** a core IT strategy
- **IDENTIFY** likely and unlikely business scenarios
- **CREATE AND TEST** four to six business event scenarios, along with the technology needed to address them
- **REHEARSE** responses to future events, such as exit strategies
- **CONSIDER** risks associated with scenarios, including cultural, market and management issues

The service has cost Swiss Re millions of dollars to build and should go live within the next two months. It's expected to speed customer service and reduce paper and administrative expenses, said Mike Loffa, executive vice president of Swiss Re's e-Reassure program.

By outsourcing the portal service to El Segundo, Calif.-based Computer Sciences Corp., Swiss Re is reducing the initial cost of building the portal while enabling its IT managers to focus on internal processes and cut down on development costs and system maintenance, he said.

When planning IT projects, Robert Wettling, CIO at Nationwide Global Holdings Inc., the overseas subsidiary of Nationwide Insurance Cos. in Columbus, Ohio, tries to use flexible development strategies to keep up with a changing marketplace.

For instance, Nationwide Global's IT team recently spent nine months developing an in-house application, only to have business executives change the strategy from build to buy. "But then, [nine months later], the management strategy changed again, and I had to outsource it," Wettling said.

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BRIEFS

Microsoft Plugs 10 Security Flaws . . .

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. . . And Sets Plan to End Support on VB 6

Microsoft also announced the planned cut-off dates for technical support of its Visual Basic Version 6.0 programming language. The company said VB 6.0 users will be able to get full maintenance support until the end of 2005. After that, Microsoft said it will fix bugs and other problems in the software as a fee-based service through 2008.

IBM Signs 10-Year Outsourcing Deals

IBM said it won a pair of 10-year outsourcing contracts, including a $563 million deal to manage the IT infrastructure of Toronto-based Manulife Financial Corp. About 400 Manulife IT employees will transfer to IBM as part of the agreement, which covers operations in Canada and the northeastern U.S. IBM also signed a deal with BT Cellnet, which runs a mobile network in the U.K.

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A computer crash at one of the U.K.'s air traffic control centers temporarily grounded flights and forced flight data to be prepared manually. . . . Beverly, Mass.-based GROOVE NETWORKS INC. this week plans to release an upgrade of its peer-to-peer collaboration system with new server software that users can install on their own networks.

Web Services Standards Issue Introduced in Antitrust Case

Microsoft legal counsel questions motive of Liberty Alliance authentication initiative

BY PATRICK THIBODEAU
WASHINGTON

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Microsoft attorney Steven Holley was grilling Sun Microsystems Inc.'s chief strategy officer, Jonathan Schwartz, about the Liberty Alliance, an industry group that is developing an alternative to Microsoft's Passport user authentication service. It was a tense, sharp exchange.

The name " 'Liberty Alliance' was created as an insult to the Microsoft corporation, was it not, because it is meant to mean liberty from Microsoft?" Holley asked.

"With all due respect, I think that's a little paranoid," replied Schwartz .

The paranoia reference was an apt one — but it applies to both sides. It has been the subtext of the remedy phase.

The nine states that refused to sign the Bush administration's settlement in favor of tougher remedies have been arguing that Microsoft will use its desktop monopoly to dominate emerging technologies such as Web services.

Web services refers to an architecture that facilitates the interoperation of software via common protocols. Framingham, Mass.-based IDC predicts that Web services, which is still in its infancy, will grow from a $1.6 billion market in 2004 to $34 billion by 2007.

In the customer authentication area of the market, much is still being decided.

Microsoft has already made some key shifts in strategy. Its initial emphasis for its Passport service involved storing customer information on its servers and becoming, in effect, an intermediary between the business and customer.

But that business model faced criticism. So last September, Microsoft — while not abandoning the model — said it would shift its priority to making the service interoperable with competing companies and allow enterprises to run it.

What's unresolved is the role Microsoft will have with the Liberty Alliance and its developing authentication standard. Microsoft hasn't joined the group, and Holley's allegation during Schwartz's testimony gave a hint of fuming Microsoft executives somewhere in the background.

But Eric Dean, president of the Liberty Alliance board and CIO at United Air Lines Inc. in Chicago, said the goal of the alliance isn't to fight Microsoft.

Dean said that when he was first approached by Sun, he stressed that Microsoft is a "big partner" of United "and we have no interest in having a war with Microsoft or competing with or having liberation from Microsoft."

Sun "was very explicit in return" that those aren't the aims of the alliance, he said.

"We need Microsoft's cooperation, and they need some of ours, and I think everyone's intent is to accomplish that," said Dean.

A Microsoft spokesman said that the "door is still open" and that the firm continues to work informally with the alliance.

The alliance includes companies such as Hewlett-Packard Co., France Telecom, General Motors Corp. and MasterCard International Inc.

That kind of corporate representation will likely ensure that authentication standards developed by Microsoft and the alliance are "probably going to be a duopoly, like Mastercard/Visa," said Rob Batchelder, an analyst at Gartner Inc. in Stamford, Conn. ▶

Microsoft's Turn

LAST WEEK: The states finished testimony in the Microsoft antitrust case.

THIS WEEK: Microsoft will begin presenting its witnesses. Chairman Bill Gates is still on tap to testify.

Quick Link For more coverage of Microsoft's ongoing legal battle, visit our Web site.
www.computerworld.com/q?s1100

Major Players Launch Web Services Security Initiative

Proposed standards aimed at addressing corporate concerns

BY CAROL SLIWA

Microsoft Corp., IBM and VeriSign Inc. last week announced a joint effort to craft standards to address security concerns that many users have raised about Web services.

But whether their effort will jump-start Web services adoption among hesitant companies remains to be seen, since many of the standards they proposed to help draft aren't expected to be completed for another 12 to 18 months.

"Their proposed set of standards seems overly complex to me," said John Pescatore, an analyst at Gartner Inc. in Stamford, Conn. Pescatore said he sees too many layers that "will have lots of overlap and lots of opportunity for confusion and interoperability problems."

However, Mike Gilpin, an analyst at Cambridge, Mass.-based Giga Information Group Inc., predicted that customers will start to use alpha implementations of the proposed standards because "this initiative has the right companies involved to make these into de facto standards quickly."

Officials at Microsoft, IBM and Mountain View, Calif.-based VeriSign said they hope the new specification they have co-authored, called WS-Security, will serve as a starting point to begin tackling the problem of Web services security. WS-Security, in part, calls for support of World Wide Web Consortium standards for XML message encryption and digital signatures.

The specification is also intended to serve as the foundation for a broader road map of additional security standards — such as federated security models, authorization and privacy — that the vendors plan to work on with other industry participants. "You have to start somewhere," said Bob Sutor, IBM's director for e-business standards strategy. "This is our intellectual contribution to get this started."

John Meyer, an analyst at Giga, said the move represents a logical step for Microsoft, IBM and VeriSign. But he said some security issues the three vendors may address could potentially conflict with security efforts from rival vendors such as Sun Microsystems Inc. ▶

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Feds See Value in XML but Face Deployment Problems

Private sector is achieving its goals with collaboration

BY PATRICK THIBODEAU
WASHINGTON

While automotive, insurance and other industries are busy deploying XML for business-to-business transactions, the federal government is still trying to figure out how to take a unified approach to the technology.

XML rollouts are already enabling some private-sector companies to scrap batch processing in favor of real-time transactions with their supply chains.

That's a benefit that people such as Vic Zappia, a senior systems analyst at American Suzuki Motor Corp. in Brea, Calif., value highly. XML is enabling Suzuki to standardize business processes with vendors and replace proprietary systems and customized applications.

But it's a process that can be achieved only after industries agree to cooperate. And that's something the federal government has yet to accomplish.

A recent report by the General Accounting Office said the government's effort to utilize XML faces pitfalls, particularly if business standards, along with XML data structures and vocabularies, diverge among various agencies. Although XML's technical standard is complete, the business standards are not, the GAO said.

The broad information-sharing enabled by XML is "at the forefront of national priorities," but the government lacks an "explicit strategy" for accomplishing that, the GAO said. It recommended that the White House Office of Management and Budget play a stronger role in XML deployments.

That sort of strong leadership has been crucial in the private sector, said Rob Perry, an analyst at The Yankee Group in Boston. "Somebody in the government has to say, 'This is the format that we're going to use.'"

The automotive industry's XML initiative is being coordinated by the Standards for Technology in Automotive Retail (STAR), a not-for-profit volunteer organization based in McLean, Va. STAR involves 14 major automotive manufacturers, including Ford Motor Co., General Motors Corp. and DaimlerChrysler AG, as well as dealers and retail systems providers. "Collaboration is key," said Zappia.

It's also important that organizations "provide their staff [with the] resources and time to make it happen," said Dick Malaise, IT director at the National Automobile Dealers Association, also in McLean, who co-chairs STAR with Zappia.

The insurance industry has a similar effort under way that's being spearheaded by the Association for Cooperative Operations Research and Development (ACORD), an industry standards-setting organization in Pearl River, N.Y. More than 350 companies representing most of the major firms affiliated with the insurance industry are participating in ongoing XML standards development, said Ronald Dudley, ACORD's vice president of standards.

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XML Debate

The General Accounting Office sees both strengths and pitfalls in XML deployments:

STRENGTH XML's human-readable data tags are easily adapted.

PITFALL Defining unique data tags can lead to compatibility problems.

STRENGTH XML standards are freely available and nonproprietary.

PITFALL Vendors can build non-standard extensions.

STRENGTH XML can improve data sharing.

PITFALL Increased access raises security concerns.

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"That means 60% of all VB code that exists today will have to be rewritten or thrown out," he said. "If you're a Microsoft shop and you haven't started a fairly aggressive .Net adoption by the middle of next year, you're in real trouble."

Sewell said Pacific Life had no problem leveraging its existing COM+ business logic in the middle of its three-tier Web applications through the use of .Net's COM interoperability feature. The Newport Beach, Calif.-based firm's life insurance division converted its Web presentation layer from Active Server Pages (ASP) to ASP.Net and built a Web service interface to the middle tier. Sewell said any small performance penalty in using XML-based messages to communicate between the presentation layer and the middle tier was more than offset by ASP.Net's speedier page delivery.

The Question Is, Does .Net Scale?

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The port took an additional man-year of effort, but Nationwide was able to eliminate 200,000 lines of proprietary C++ middle-tier infrastructure code in favor of 10,000 lines of Visual Basic .Net, because the .Net framework supplied functionality that was equivalent to what his firm had built, Green said.

"The application now runs more reliably than the original," Green said, noting that he found the .Net framework to be "rock solid." The Visual Studio .Net tool, however, is "perhaps less mature," he said.

"It doesn't deal very well with large numbers of interdependent assemblies, which are the executable files in .Net," Green said. "This will only be a problem for people with large projects, because they're going to have lots of assemblies calling each other, and it's difficult to keep the versions of the assemblies consistent. But it's not a particularly hard problem to overcome."

– *Carol Sliwa*

.Net on Their Minds

Users attending Microsoft's TechEd 2002 conference last week shared their thoughts on Microsoft's new .Net development environment:

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Feds See Value in XML but Face Deployment Problems

Private sector is achieving its goals with collaboration

BY PATRICK THIBODEAU
WASHINGTON

While automotive, insurance and other industries are busy deploying XML for business-to-business transactions, the federal government is still trying to figure out how to take a unified approach to the technology.

XML rollouts are already enabling some private-sector companies to scrap batch processing in favor of real-time transactions with their supply chains.

That's a benefit that people such as Vic Zappia, a senior systems analyst at American Suzuki Motor Corp. in Brea, Calif., value highly. XML is enabling Suzuki to standardize business processes with vendors and replace proprietary systems and customized applications.

But it's a process that can be achieved only after industries agree to cooperate. And that's something the federal government has yet to accomplish.

A recent report by the General Accounting Office said the government's effort to utilize XML faces pitfalls, particularly if business standards, along with XML data structures and vocabularies, diverge among various agencies. Although XML's technical standard is complete, the business standards are not, the GAO said.

The broad information-sharing enabled by XML is "at the forefront of national priorities," but the government lacks an "explicit strategy" for accomplishing that, the GAO said. It recommended that the White House Office of Management and Budget play a stronger role in XML deployments.

That sort of strong leadership has been crucial in the private sector, said Rob Perry, an analyst at The Yankee Group in Boston. "Somebody in the government has to say, This is the format that we're going to use."

The automotive industry's XML initiative is being coordinated by the Standards for Technology in Automotive Retail (STAR), a not-for-profit volunteer organization based in McLean, Va. STAR involves 14 major automotive manufacturers, including Ford Motor Co., General Motors Corp. and DaimlerChrysler AG, as well as dealers and retail systems providers. "Collaboration is key," said Zappia.

It's also important that organizations "provide their staff [with the] resources and time to make it happen," said Dick

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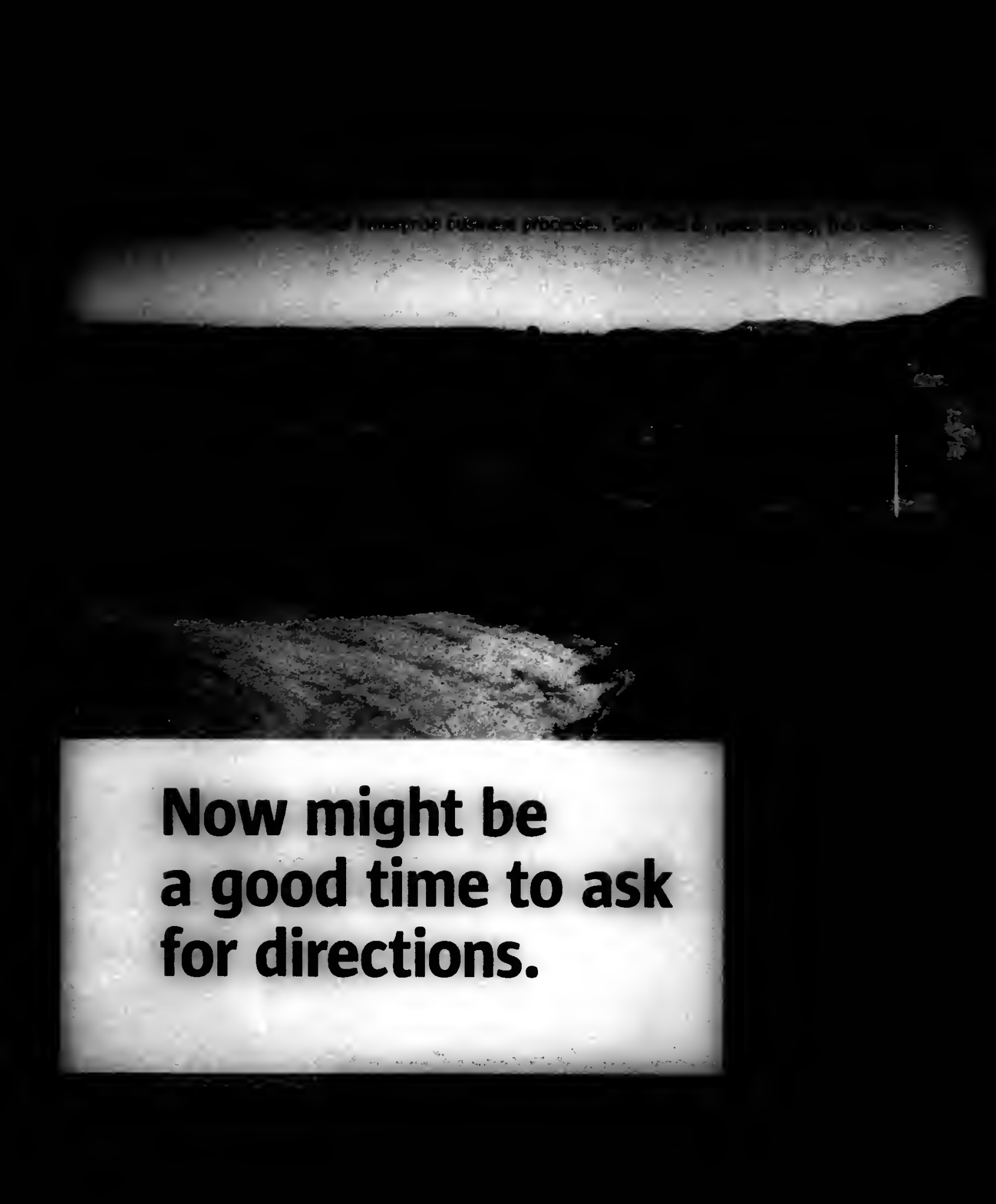
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BRIEFS

Compaq Says Q1 Results on Track

Compaq Computer Corp. said its first-quarter financial results should meet or slightly exceed the projections it made in January. The company said revenue should total about $7.7 billion, up from its earlier estimate of $7.6 billion. First-quarter profits are expected to come in at about $18 million.

Network Associates Ups Offer for McAfee

Santa Clara, Calif.-based Network Associates Inc. increased the value of its stock-swap offer for the shares of McAfee.com Corp. that it doesn't already own, and McAfee.com's board recommended accepting the new bid. Sunnyvale, Calif.-based McAfee.com had rejected the initial offer made last month by Network Associates, which owns 75% of the antivirus software vendor.

Nortel Extends Credit Deal, Issues Warning

Nortel Networks Ltd. warned that its first-quarter revenue was below plan, which will result in a larger-than-expected loss. Brampton, Ontario-based Nortel initially also said that it hadn't been able to get an extension on a $1.75 billion credit line that was due to expire. But it later announced that its 27 banks agreed to a lesser amount of $1.175 billion.

Short Takes

Just days after announcing that three of its top executives had resigned, Rochester, N.H.-based ENTERASYS NETWORKS INC. said it was laying off 30% of its employees. . . . PEGASYSTEMS INC., a Cambridge, Mass.-based developer of customer relationship management software, said it was told by the SECURITIES AND EXCHANGE COMMISSION that a two-year-old investigation into its accounting practices had ended.

CA Narrows Strategy, Sells Off Applications

Most of its interBiz software goes to SSA after failing to reach 'critical mass'

BY TODD R. WEISS

COMPUTER Associates International Inc. is usually on the buyer side of technology deals. But last week, the software vendor was in selling mode.

CA disclosed that it has sold most of its manufacturing and business applications to Chicago-based SSA Global Technologies Inc., a long-struggling company that previously was known as System Software Associates Inc. The deal includes the supply chain, finance and human resources product lines from CA's interBiz division.

Officials at Islandia, N.Y.-based CA wouldn't comment in detail or disclose the purchase price. But CEO Sanjay Kumar foreshadowed the deal during a February interview, saying that the interBiz applications needed "more critical mass" in the market than CA had been able to achieve.

The sell-off could benefit companies that use such interBiz products as ManMan, Masterpiece/Net and PRMS, users and analysts said.

Warren Smith, IT director at the Victor Reinz division of Toledo, Ohio-based auto parts maker Dana Corp., said CA has had trouble focusing on its core software products while also trying to maintain the aging interBiz applications.

Victor Reinz, which makes vehicle engine components, has used the ManMan manufacturing software since 1986, long before CA bought the interBiz applications in a series of acquisitions. The sale to SSA "will be a good thing for us," said Smith, who is also president of the Computer Applications for Manufacturing Users Society International Inc., a San Jose-based user group.

Bob Anderson, an analyst at Stamford, Conn.-based Gartner Inc., said that interBiz never really fit with CA's overall strategy or its other product lines. The applications should "be a substantial part of SSA's business going forward," he said. "They were kind of on the back burner with CA."

SSA, which was bought two years ago by a turnaround firm, said it hopes the interBiz applications can help it regain a leadership position in vertical industries such as automotive and consumer goods.

The company expects to lay off about 325 of the 725 interBiz employees who are being shifted from CA as part of the deal, said SSA CEO Mike Greenough. But he said SSA is making a "very clear" commitment to extending the life of investments made by interBiz users.

"I'm not particularly worried about the products," said Andrew Winer, CIO at Myers Industries Inc., an Akron, Ohio-based maker of plastic and rubber goods that has used PRMS and Masterpiece for more than 10 years. But a face-to-face talk with SSA executives would make him feel more comfortable, Winer added.

CA also said revenue for its fourth quarter ended March 31 will total about $770 million, in line with earlier predictions. But it will report a sixth straight quarterly loss. ▶

Reporter Marc L. Songini contributed to this report.

Software Swap

WHAT CA SOLD TO SSA: Its interBiz supply chain, finance and human resources applications.

WHAT IT KEPT: Banking software and underlying integration technology.

WHY IT MADE THE SALE: To focus on markets such as enterprise management, security and storage.

IBM Joins First-Quarter Warnings Crowd

Slowdown in IT spending causes revenue shortfall

BY JAIKUMAR VIJAYAN

IBM's warning that its first-quarter financial results will be well below expectations shows that the slowdown in IT spending may finally be catching up to the company.

IBM had appeared to be more immune to spending cutbacks than most other IT vendors. But after making its numbers during the previous three quarters, it said last week that preliminary first-quarter results show a substantial shortfall in revenue and profits.

The company said first-quarter revenue will likely total about $18.5 billion, down from $21 billion in the same period last year. Wall Street analysts had forecast revenue of $19.7 billion, but John Joyce, IBM's chief financial officer, said sales were affected by a continued slowdown in buying decisions by many customers.

The hardest-hit business was IBM's Technology Group, which makes chips and disk drives. Joyce said its sales will be down 35% on a year-to-year basis, resulting in pretax loss of about $200 million for the unit.

But it's reasonable to expect that IBM's core hardware products have been similarly affected by the spending slowdown, said Ashok Kumar, an analyst at U.S. Bancorp Piper Jaffray Inc. in Minneapolis.

"It has to have occurred across many business segments for them to miss the quarter by this wide a margin," Kumar said.

For example, overall sales of servers — one of IBM's key products — have significantly declined since early last year. According to estimates by Framingham, Mass.-based research firm IDC, the worldwide server market dropped from $60.1 billion in 2000 to $48.3 billion last year. The top four vendors, including IBM, all had lower sales (see chart).

For IBM, the decline had been softened somewhat by strong sales of its zSeries mainframes. But IDC analyst Jean Bozman said vendors face the need to cut prices because of competitive pressure, especially in the Unix server portion of the market. ▶

	2000	2001*	CHANGE
IBM	$13.4B	$12.8B	-5.9%
Compaq	$9.9B	$7.7B	-22%
Sun Microsystems	$10.2B	$6.9B	-32%
Hewlett-Packard	$8B	$6.9B	-23%

SOURCE: IDC, FRAMINGHAM, MASS.

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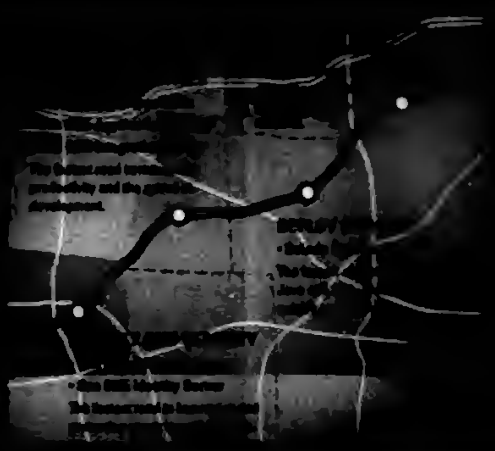

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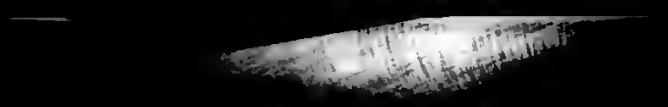

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Belluzzo: Microsoft Needed New Management Structure

BY DON TENNANT

Microsoft Corp. this month announced that **Rick Belluzzo** will resign as president and chief operating officer, effective May 1. Belluzzo, formerly an executive at Hewlett-Packard Co. and CEO at Silicon Graphics Inc. in Mountain View, Calif., joined Microsoft in 1999. He became president 14 months ago, but he's stepping down as part of a reorganization that gives more responsibility to the heads of the company's seven product groups. He spoke with *Computerworld* last week.

When did it first hit you that you wouldn't be working for Microsoft for as long as you might have expected? I took the president's job in February last year, and the biggest thing I concluded was we needed to structure the business differently. . . . And it probably wasn't until the February-March time frame [of this year] that it was reasonably clear that the right answer was to move to this new model and for me to pursue something else. This was mainly a process between [CEO] Steve [Ballmer] and me.

BELLUZZO: "It would not be uncommon for me to express a view that was a bit nontraditional."

You've said that Ballmer being such a hands-on guy wasn't a "deal breaker" for you. Was there one? It came down to the point that we needed to have these seven business owners having a fairly end-to-end kind of view of running their businesses. You need someone to manage [them], and that person probably should be the CEO.

How about steps Microsoft might have taken to assuage the anticompetitive criticism it gets – say, delivering Office for Linux? Did you lobby for anything along those lines? I don't know if *lobby* is the right word. We would always have discussions about our strategy and our policy and how things could change. And since I came from a different world, it would not be uncommon for me to express a view that was a bit nontraditional.

Can you elaborate a little on the Linux discussions? We talk about Linux all the time. We talk mostly about the fact that we need to build and deliver a better value proposition [with] Windows-based products.

Do you personally believe that Microsoft should deliver a version of Office on Linux? No, I don't. I think a lot of the cross-platform things sound really attractive and interesting, but in reality, it's very hard to make that business model work well.

As a former employee of HP, what's your view of the company's merger with Compaq Computer Corp.? It's easy to be on the outside and to critique it. But I think a merger like that is very, very hard. It's too early to tell whether the direction is something that will make a difference for the companies and the customers they serve. I think that will be very clear over the next year as to whether, in fact, the combination of those two companies can create a strong enterprise player in the industry. I think it would be good for the industry if that could occur, but I think it's very hard to execute on something like this. ▶

Quick Link To read our full interview with Belluzzo, visit our Web site: www.computerworld.com/q/728802

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PATRICIA KEEFE

Playing Hardball

LET FEDERAL RESERVE CHAIRMAN Alan Greenspan talk about a recovery; we're not out of the woods yet. Oracle, PeopleSoft and IBM have all either issued warnings of lower-than-expected revenues for the quarter or missed their numbers. Computer Associates said it expects to report a loss for its sixth consecutive unprofitable quarter. Even Microsoft is expected to lower its forecast for the year.

Patricia Keefe is editorial director of *Computerworld*. You can contact her at patricia_keefe@computerworld.com.

The driving force behind all this gloom and red ink? Most corporations have frozen their tech budgets and put off application upgrades and purchases. A recent Forrester Research survey of North American executives found that only 26% of the 874 respondents will consider buying enterprise applications this year, down considerably from 58% in 2001. The impact on vendors? Oracle's new software revenue reportedly dropped by nearly a third from the same quarter a year ago. CA customers are buying cheaper, shorter-term packages. Microsoft users are snubbing new key products.

That's because many IT departments have simply refocused on what's looking like this year's top priority: integrating islands of expensive applications. This is a good thing, unless you're a software vendor desperately trying to milk your existing accounts.

It's a whole new ballgame all right, but one that vendors are determined to win. Which means users must seriously prepare for tough license negotiations. Why? If you won't pry open your wallets, vendors aren't above forcing the issue.

IBM (with mainframe software licensing), Microsoft (with its Software Assurance licensing model) and Oracle (whose license changes critics have labeled unfair) have all come up with expensive, inflexible or overly complicated licensing schemes in the past 18 months. All of these plans left users so angry and confused that each vendor backed off — for now. But they've only delayed the inevitable.

Users must go on the offensive to protect their budgets. To get you started, here are just a few suggestions culled from savvy observers, including consultant and former *Computerworld* columnist Joe Auer and analysts from Gartner and Meta Group:

■ **Get serious about asset management programs.** It's a lot of work, but they let you know who is using what when and on what. Unless you know your current patterns and can accurately predict future usage, these new licensing plans will cost you big money down the road.

■ **Know your opponent.** Research your vendor's financial situation. Dropping sales or red ink may mean the vendor is more disposed to sweetening your deal.

■ **Determine your alternatives upfront.** Can you switch to another product? Can you alter your need for the application? Do you really need it?

■ **Examine your licensing options.** What are your choices — all of them — and which best fits your needs and budget? What technical information do you need to gather to evaluate the licensing options?

■ **Develop a strategy and sign on all of the key players.** This will stop sales personnel from bypassing IT. But feel free to go around uncooperative sales negotiators; you may find key vendor executives more willing to listen to an alternative offer.

■ **Negotiate as close as possible to the end of the quarter or fiscal year to maximize bargaining leverage.** Offer to delay decisions until the next quarter.

Remember, you may be locked into their software, but they need your money, and soon. Sweating the details and doing your homework upfront can make a difference you can take to the bank. ◗

PIMM FOX

A Project By Any Other Name

CORPORATE IT projects and military campaigns have something in common. Both receive monikers designed to either focus the team or heighten the participants' resolve.

This name game is fraught with problems, as the Pentagon found when it named the military operation in Afghanistan Infinite Justice. For some, that sounded like "eternal retribution," usurping the Almighty's role. As a result, Enduring Freedom was penciled in, and we became sensitized to the repercussions of names.

Pimm Fox is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

And yet there isn't a proven convention for IT projects to take into account the relevancy of a name. At RightNow Technologies, an online customer service software vendor in Bozeman, Mont., IT project names are borrowed from geysers; after all, the company is only a boulder's throw from Yellowstone National Park. There's also a hidden meaning to choosing geysers, according to Mike Myer, RightNow's vice president of product development. "Prior to a new software release, there's a lot of steam and vapor," he says. "Also, just like a geyser, you never can tell when something unpredictable will happen, and finally, sometimes after the release, people go: 'So what?' " RightNow gets help from a Web site (*www.geyserstudy.org/geyser_main.htm*) in selecting names.

At Du Pont, project names are left to project leaders, says Ronald Carrick, CIO of the packaging and industrial polymers business. "We don't have a rigid process for naming, but most often they are named in a way that

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makes three or four [letters] work," he says, citing CAR (corporate authorization record) and SAM (strategic account management) as examples.

Experts in naming and branding place a premium on names, and perhaps IT professionals should as well. "Names are the ultimate sound bite," says Burt Alper, strategy director of naming firm Catchword LLC. Alper says names don't have to be descriptive, but they should have some connection to what's being accomplished.

Richard Owens, president of TDC/The Design Company, says choosing a name is also a creative outlet for a team. "It's a fun moment and can have power because it can be a secret," he says. But, the fun can turn to frustration if teams don't find a name everyone agrees on. "Names are about words and semantics," says Owens. "Choosing a project name should connect a word with an outcome." Latin and Greek word roots help generate names that resonate with meaning.

In the military, blending verbs with nouns seems popular, as in Uphold Democracy, making it sound like a mission statement. But in searching for names of projects, we've yet to encounter one called Ultimate Peace.

DAN GILLMOR

Call to Arms: Defend IT's Potential

POLITICAL EDUCATION and action haven't typically been part of the average IT professional's job description. But as politicians get more active in regulating technology, that may have to change.

Congress is contemplating laws — including a copy-protection mandate — that would severely restrict the deployment and utility of all kinds of technology. Some tech-industry leaders are waking up to the threats, but they need help. So, the larger IT community will have to get involved, too.

The mandate in question is legislation proposed by Sen. Fritz Hollings (D-S.C.). The Consumer Broadband and Digital Television Promotion Act would require all digital gear to include technology that would prevent unauthorized copying of digital content. By all accounts, this travesty won't pass anytime soon. Yet the fact that it's getting a serious hearing shows trouble is coming.

DAN GILLMOR is technology columnist at the *San Jose Mercury News*. Contact him at dgillmor@sjmercury.com.

Putting technology in chains wouldn't just wipe out the public domain for ideas and wreck long-standing customer rights. It would also wreak havoc for IT people who are bringing the benefits of technology into their enterprises.

You can count on very few fingers the number of technically literate members of Congress, where reliance on staff members and lobbyists is a tradition and, too often, a necessity in a complex world. Unfortunately, the members' lack of knowledge has a habit of translating into laws and proposals that are unhelpful at best. The Hollings bill is only one in a long line of bad ideas.

Congress takes frequent shots at the First Amendment in cyberspace, for example. The Communications Decency Act and a follow-up law both fell in the courts, but not before wasting a lot of people's time. Look for a similar fate for a law, now under scrutiny in the courts, mandating Internet content filters on public library computers.

But as much as those were attacks on free speech, they weren't necessarily the province of IT. Business didn't see itself as being directly affected.

It was different when the Clinton administration worked to prevent strong encryption from being part of products that might be exported. Technically astute corporate leaders, many from Silicon Valley, took the lead in explaining to Congress the futility of the policy.

Some top high-tech officials have recognized the threat of the Hollings bill and are speaking out against it. But they and their compatriots sat on their hands in 1998 when Congress passed the Digital Millennium Copyright Act, which has done profound damage to customer rights and free speech. To be fair, few people recognized how bad that law would be.

IT people formed a wide defensive front when the software industry and its entertainment allies pushed states to adopt the Uniform Computer Information Transactions Act, which grossly tilts the balance toward sellers and away from buyers. Its failure to make headway recently is due in large part to objections in the IT user community.

Most people find technology hard to understand. But as technology increasingly infiltrates of our lives, it becomes essential for rank-and-file IT people, not just bosses, to demystify and defend it. They need to explain the value of unfettered technology to families and friends, to their local leaders and members of Congress, to anyone who'll listen.

More than careers ride on these legal debates. Our digital future is up for grabs.

READERS' LETTERS

ITAA Isn't Credible

THE INFORMATION Technology Association of America once again exaggerates the need for foreign workers ["DOD May Ban Foreign IT Workers," Page One, March 25]. The ITAA isn't a credible adviser on defense policy. It is a group of multinational technology giants driven by bottom-line profits to favor cheap foreign labor.

Rob Stuehler
Senior analyst
San Francisco

ITAA PRESIDENT Harris Miller's letter to the Pentagon is just bunk. If there were jobs out there, they could be filled by U.S. citizens — many companies just aren't hiring. The Boston Software Process Improvement Network has been conducting a survey of member companies. Although we have surveyed only a small number at this point, we're seeing a trend of no new hires for the rest of the year. Instead of the labor shortages discussed in the article, I think we should be talking about job shortages in the high-tech field.

Linda McInnis
Chairman
BostonSPIN
Acton, Mass.

Remedies for a Monopoly

MICHAEL GARTENBERG'S column "Enough Is Enough With Microsoft Case" [News Opinion, March 25] has too many factual and logical errors to fit into a 200-word letter. Let me try. 1.) "The sole beneficiary of [a modular Windows] would be Microsoft's competition." I would benefit from choice, and I'm not a competitor. 2.) "Enterprise, small business and consumer customers have all clearly benefited from the integrated features of Windows." I *hate* some of the junk already glued into Windows 2000. What will happen when no competition is left? 3.) "The rub in the story is that the company [that first integrated a TCP/IP stack] wasn't Microsoft, but Apple Computer." Is Apple a monopoly? 4.) With PCs, "customers are free to upgrade and replace what they see fit." With XP, Microsoft has to OK upgrades. 5.) "Arrogance and incompetence led to Netscape's share loss." Which is why Microsoft first had to give away Internet Explorer, then forced you to take it. 6.) "Microsoft doesn't own the media player space." All things with time. MediaPlayer wasn't bolted in until Windows 2000. 7.) "The DOJ and [Microsoft] wisely agreed to terms to [modify some of Microsoft's business practices]." What got modified other than what was done in Microsoft's favor?

Steven Rubenstein
Murfreesboro, Tenn.

I WOULD AGREE with the opinion "that some of Microsoft's business practices needed to be modified," but not that the proposed settlement contained "terms to do just that." As I understand it, the proposed terms don't make enough modifications to Microsoft's business practices to prevent it from doing what it has done in the past, just in new and different ways.

Steven White
Bloomington, Minn.

PDA Depression

WHEN THE CENSUS is complete, will these 500,000 mobile computing devices be dumped on eBay, depressing new PDA prices ["U.S. Census Bureau Plans for First Paperless Tally in 2010", News, March 18]?

Keith Koonin
Lincolnshire, Ill.

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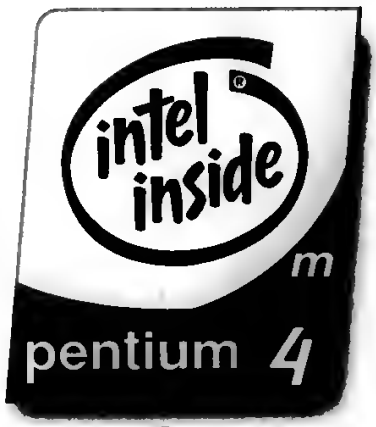

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KNOWLEDGE CENTER: DATA MANAGEMENT

DAVID HOLLENBACH

Taming Data Chaos

Users try to bring order to a hodgepodge of data — and extract real intelligence.

EDITOR'S NOTE

THAT MOTLEY COLLECTION of corporate data you've been accumulating probably resembles a Jackson Pollock painting, as my colleague Pimm Fox puts it so colorfully. Several drips over here, a few splatters over there, a big blob right here.

It's a mess: There are departmental data silos and data marts and data warehouses, not to mention those end-user spreadsheets. Every day, more and more data pours into the enterprise from Web clickstreams, consumer transactions and external data vendors. Meanwhile, the folks in marketing want to do sophisticated data mining and create a single view of the customer's various contacts with the company.

Given this situation, it's not surprising that the top two issues in data management are the following:

1. Integration: Merging, cleansing and standardizing data as part of an information quality program while integrating those data silos.

2. Scalability: Making sure the hardware, software and networks can handle increasing amounts of data and growing business demands — without crashing or slowing to a crawl.

Those problems surface throughout this special report, which includes many tips from your peers on how to cope.

Now, I know that data integration and database scalability involve hard work, and it isn't particularly glamorous work — yet. But as companies begin to realize that data is a valuable business asset — just as valuable as the other assets they manage, perhaps more so — then data management will become a very high-profile function indeed.

In fact, if your company is implementing a CRM, ERP or supply chain system, then it has already (implicitly) decided that it's in the data management business. Within the next two years, more business decisions will be based on electronic data, and more interactions with customers and suppliers will be handled by electronic data systems.

What could be more important than that?

Mitch Betts (mitch_betts@computerworld.com) is director of Computerworld's *Knowledge Centers.*

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- Data management in the retail and transportation industries.
- How to make chief financial officers happy with financial analytics.

Quick Hit: Visit the Data Management Knowledge Center: [illegible]

The Story So Far

Users such as BF Goodrich and Procter & Gamble played a major role in the history of database and business intelligence software.

By Frank Hayes

FIFTY YEARS AGO, data management was simple. Data processing meant running millions of punched cards through banks of sorting, collating and tabulating machines, with the results being printed on paper or punched onto still more cards. And data management meant physically storing and hauling around all those punched cards.

That began to change in 1951, when Remington Rand Inc.'s Univac I computer offered a magnetic tape drive that could input hundreds of records per second. In 1956, IBM rolled out the first disk drive, the Model 305 RAMAC. The drive had 50 platters, each 2 ft. in diameter, that could hold a total of 5MB of data. With disks, data could be accessed at random, not just sequentially, as with cards and tape.

But for decades, most firms had only used data in batch runs for accounting, and it took time for an idea like navigating through data to catch on.

Data Management Is Born

In 1961, Charles Bachman at General Electric Co. developed the first successful database management system. Bachman's integrated data store (IDS) featured data schemas and logging. But it ran only on GE mainframes, could use only a single file for the database, and all generation of data tables had to be hand-coded.

One customer, BF Goodrich Chemical Co., eventually had to rewrite the entire system to make it usable, calling the result integrated data management system (IDMS).

In 1968, IBM rolled out IMS, a hierarchical database for its mainframes. In 1973, Cullinane Corp. (later called Cullinet Software Inc.) began selling a much-enhanced version of Goodrich's IDMS and was on its way to becoming the largest software company in the world at that time.

Meanwhile, IBM researcher Edgar F. "Ted" Codd was looking for a better way to organize databases. In 1969, Codd came up with the idea of a relational database, organized entirely in flat tables. IBM put more people to work on the project, code-named System/R, in its San Jose labs. However, IBM's commitment to IMS kept System/R from becoming a product until 1980.

But at the University of California, Berkeley in 1973, Michael Stonebraker and Eugene Wong used published information on System/R to begin work on their own relational database. Their Ingres project would eventually be commercialized by Oracle Corp., Ingres Corp. and other Silicon Valley vendors. And in 1976, Honeywell Inc. shipped Multics Relational Data Store, the first commercial relational database.

By the late 1960s, a new kind of database software was being developed: decision support systems (DSS), designed to let managers put data to better use in their decision-making. The first commercial online analytical processing tool, Express, became available in 1970. Other DSS systems followed, many developed inside corporate IT departments.

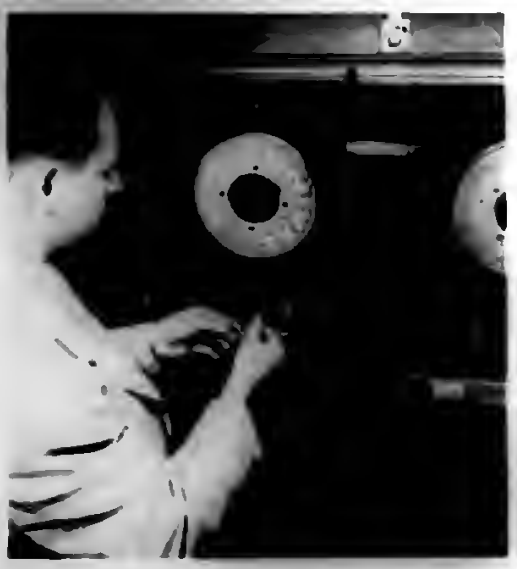
In 1985, the first "business intelligence" system was developed for Procter & Gamble Co. by Metaphor Computer Systems Inc. to link sales information and retail scanner data. That same year, Pilot Software Inc. began selling Command Center, the first commercial client/server executive information system.

Also that year, back at Berkeley, the Ingres project had mutated into Postgres, with a goal of developing an object-oriented database. The next year, Graphael Inc. shipped Gbase, the first commercial object database.

In 1988, IBM researchers Barry Devlin and Paul Murphy coined the term *information warehouse*, and IT shops began building experimental data warehouses. In 1991, W.H. "Bill" Inmon made data warehouses practical when he published a how-to guide, *Building the Data Warehouse* (John Wiley & Sons).

With the widespread adoption of PC-based client/server computing and packaged enterprise software in the 1990s, the transformation of data management was complete. It was no longer just storing and maintaining data, but slicing, dicing and serving it up in whatever ways users demanded.

And now, on with the story. . . . ▶



◀ **1951:** The Univac uses **magnetic tape** as well as punched cards for data storage.

1956: IBM introduces first **magnetic hard disk drive** in its Model 305 RAMAC.

1961: Charles Bachman at GE develops the first **database management system**, IDS.

1968: IBM offers the **IMS** hierarchical database for System/360 mainframes.

1969: Edgar F. "Ted" Codd ▶ invents the relational database.

1973: Cullinane, led by **John J. Cullinane**, ships IDMS, a network-model database for IBM mainframes.

1976: Honeywell ships **Multics Relational Data Store**, the first commercial relational database.

1979: Oracle introduces the first commercial **SQL relational database** management system.

1983: IBM introduces **DB2**.

1985: The first **business intelligence** system is designed for Procter & Gamble.

▲ **1991: W.H. "Bill" Inmon** publishes *Building the Data Warehouse*.

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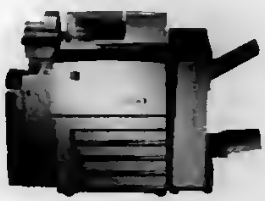

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Merging Data Silos

Combining data from various databases is hard work. But it could save your CRM, ERP and supply chain projects.

By Kim S. Nash

REDUNDANT DATA, wrong data, missing data, miscoded data. Every company has some of each, probably residing in IT nooks that don't communicate much.

It's not a new problem, but these days the jumble becomes very apparent during high-profile projects, such as installing enterprise resource planning (ERP) or supply chain management software.

Companies often focus on the business process and not on the form and congruity of the resulting data, says John Hagerty, an analyst at AMR Research Inc. in Boston. When a company does that, a frustrated IT department has to step back from the glamour work to cleanse, reconcile and integrate data from various silos around the company.

For example, different sales, inventory or manufacturing systems at a clothing retailer might track the same item by different names. A central database — if there is one — might include "extra large," "XL" and "TG" (for the French term *tres grande*). But they all refer to the same thing.

And then there's the attic problem familiar to most homeowners: Toss in enough boxes of seasonal clothes, holiday trim, family history documents and other important items, and soon there's a stored mess that's too big to manage. That can happen at companies, too. Multiple operating units, manufac-

Continued on page 32

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Continued from page 30

turing plants and other facilities may all run different vendors' applications to do sales, human resources and other tasks. That mix of disparate data makes for a mass of unsorted and unreconciled information.

When it's time for integration, Hagerty says, the question becomes, "Do I throw out the five or six applications that capture my data and put in one new application? Or do I take the data and scrub it, reconcile it, organize it?"

Either way, he says, "it's a humongous effort. No question about that."

Getting It All Under One Roof

Shell Exploration and Production is in the throes of such a project. Early last year, the fuel company wanted to combine data from its SAP AG financial applications with data from its mishmash of volumetric systems, which process information on how much gas and oil the company finds and collects.

"Every different system has it's own internal sets of codes," explains Steve Mntch, data warehouse team leader at Shell Exploration in Aberdeen, Scotland. "Going back and cleansing the data in those host systems wasn't an option." It would have taken too much time and been too expensive, he says. Instead, Mutch found a tool from Kalido Ltd. in London that maps the data from various systems and combines it into one warehouse.

After nearly seven months of mapping work, 27 data sources now come together in a 450GB warehouse, Mutch says.

Corporate politics weren't too bad because no single business unit lost control of its data, he says. And now they all contribute to a greater understanding of the information for the company as a whole.

"Once the concept was proved, we had pressure from the top [executives] to integrate other [applications as well]," he says. "They could see themselves what information they could now get and how powerful it is."

Even if a company decides to replace different applications with one new one as a way to address data chaos, it probably won't be easy.

Many of the top customer relationship management (CRM) and ERP vendors, for example, offer suites comprised of their own applications plus others they have acquired.

The products in the suites, therefore, weren't built together and may not pass data back and forth smoothly, says Jon Dell'Antonia, vice president of MIS at OshKosh B'Gosh Inc., a clothing maker in Oshkosh, Wis. "You immediately find out it's not seamless."

ERP vendors are trying to address the issue by providing data models and data warehouses with their suites. But Dell'Antonia has avoided ERP suites. His approach to data integration is to have a homegrown IBM DB2 warehouse that unifies data from different applications.

For example, in one of OshKosh B'Gosh's transaction-processing applications, the term "sales" is used. But on the user interface, it's called "customer sales."

A tool from DataMirror Corp. in Toronto uploads sales data to DB2 once a day. And the data warehouse recognizes the differently named items as the same because OshKosh B'Gosh programmers created tags that reconcile incoming data elements.

Cleaning House

Before any data can be cleansed, your IT department must devise a plan for finding and collecting it all and then figure out how to manage it once it's in hand. Those who have been there offer this advice:

1. **Determine which types of information must be captured.** To do this, form a data mapping committee - but keep it small or risk never reaching agreement.
2. **Find mapping software that can harvest data from many sources.** Possible sources include legacy applications, PC files, HTML files, unstructured data sources and enterprisewide systems such as ERP. One vendor that offers tools to unify data drawn from disparate applications is London-based Kalido, a start-up data warehousing company.
3. **Start with a high-payoff project.** The first data integration project should be inside a business unit that produces a lot of revenue for the company, says Cathy Witt, CIO at CompUSA. "It's sometimes easier, you might think, to start with a small business unit, but you won't get the cost justification" that leads to buy-in from upper management, she says.
4. **Create a process for mapping, cleansing and collating that's repeatable,** advises John Hagerty, an analyst at AMR Research. "Build it in such a way that whenever you want to get a current view of a type of data, you can run one report," he says. "Data integration is not a one-shot deal. Companies constantly have to deal with it."

The data silo issue caused serious customer service problems for Southern Illinois Healthcare, a Carbondale, Ill.-based network of six rural hospitals.

Each hospital ran its own database, which meant that when a patient of one facility sought treatment at another, he had to reregister. That was bothersome, and the problem was compounded by the fact that these customers were usually sick and therefore not in the best of moods.

"They got tired of giving the same information again and again," says Frank Sears, CIO at Southern Illinois Healthcare.

Sharing Information

Replacing the different applications at each hospital was too expensive, so the company opted for what is known in health care as an enterprise master patient index. In October 1999, Sears hired Madison Information Technologies Inc. in Chicago to help build the index. Madison also provided tools to allow data on patients from one facility to be propagated to other facilities in a common format.

By the time the project was done in April 2000, Southern Illinois Healthcare had extended the system to four affiliated clinics as well.

But it's not over. There's also an opportunity to eliminate many medication errors by integrating the right data, Sears says. "Making sure you have the right drug, procedure and patient all boils down to someone making a choice [based on information]," he says. "Some of it can't be automated, but some of it can," with bar-coded wrist bands and medication bags from a dispensing system, he explains.

"These are data integration issues," says Sears.

Cost-justifying data integration projects isn't all that hard, users say.

"Once you start putting all [your data] in one spot, all the past sins are clearly visible," says Cathy Witt, the CIO at computer retailer CompUSA Inc., which is based in Dallas.

The logic to use when broaching the subject with business unit managers is simple, she says: "You tell them, 'Data makes us what we are. If I can give you good clean data, as opposed to your only being able to use a portion of it, you will make better decisions.' " That's how Witt convinced CompUSA's retail stores and, later, the product warranty unit, to fund a data cleanup last year.

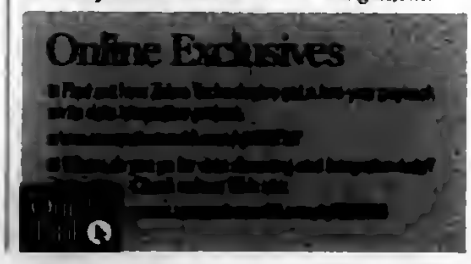
To help CompUSA sell more warranties on its consumer computer products, the IT department now culls sales data from its Siebel Systems Inc. CRM applications. The data is then sent through a cleansing tool from Trillium Software in Billerica, Mass. The Trillium tool searches for duplicate and incomplete information. It also helps fill in missing information by, for instance, matching ZIP codes against its own ZIP code database.

The data is then put in a warehouse to be analyzed and mined by sales agents.

Although third-party data cleansers could do the same work, Witt didn't want to farm out the job.

"We have the skills," she says, "and we care about the quality of our data more than anyone else does."

Nash is a freelance writer in Yorktown Heights, N.Y.



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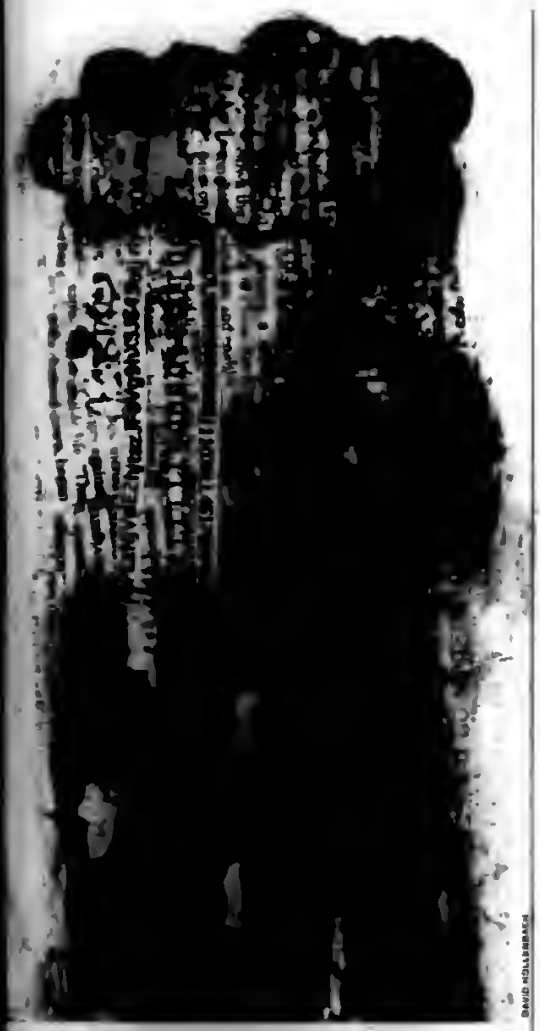

External business intelligence can be a powerful addition to your data warehouse, but beware of data overload.

By Stacy Collett

Incoming!

ONCE A WEEK, JIM REVAK, IT manager at The Sherwin-Williams Co. in Cleveland, faces the daunting task of collecting business intelligence from 15,000 third-party retailers that sell the company's paint products and downloading that information into a data warehouse.

Customer demographics and data on 4,000 products arrive from Sherwin-Williams' major retailers in disparate formats. Add to that the handful of external data the company collects from other sources, and you've got a data warehousing nightmare.

"The good news is, you have a lot more information on how your products are doing out there with your customers. But the bad news is, it's so overwhelming. We don't have enough arms and legs" to analyze all the information, Revak says.

Welcome to the world of external data overload.

External information in corporate data warehouses has increased during the past few years because of the wealth of information available, the desire to work more closely with third parties and business partners, and the Internet, says Warren Thornthwaite, co-founder of data warehousing consultancy InfoDynamics LLC in Menlo Park, Calif.

Don't be fooled by the abundance of "reliable" data for sale or the deceptive simplicity of integrating it, industry observers caution. Not only does the additional data consume disk space and go largely unanalyzed, but the amount of "pick-and-shovel work" required to clean up all of those files also increases exponentially for the IT department, says Revak.

The key is getting the data from trusted sources and creating a full design and development life cycle.

Acquiring the Data

Krispy Kreme Doughnuts Inc. in Winston-Salem, N.C., sells more than 2 billion pastries annually at 218 franchises and at thousands of grocery-store bakery cases across the country. But keeping track of its sales at myriad stores became a challenge.

So Krispy Kreme acquired external data from Deerfield, Ill.-based Efficient Marketing Services Inc., which takes checkout scanner data from grocery stores, refines it into codes compatible with Krispy Kreme's data warehouse and transmits it via file transfer protocol to Krispy Kreme each Friday morning. That information helps the company speed up its billing cycle and understand how its pastries get lost or stolen. It also helps Krispy Kreme reach more customers and markets, says Frank Hood, the doughnut maker's vice president of information services.

Each grocery store could have been asked to send its scanned data directly to Krispy Kreme in return for information on how that store is doing compared to its competitors. But Krispy Kreme's IT executives preferred a faster integration method purchased by subscription from a third party.

Tips for Managing External Data

DO purchase external data from a reliable source that will do most of the refining for you and will work with you on contingency plans.

DO run a test load first. A test load can be distinguished from a production load at the file level -- in the metadata or the file name.

DON'T collect data until business and IT staff have agreed on the amount, frequency, format and content of the data you need.

DON'T acquire more data or use more data sources than you really need.

DON'T mingle external and homegrown data without adding a unique batch identifier to each record, in case you need to pull it out.

DON'T overestimate the data's integrity. Nothing beats direct customer contact and tactical details behind the data.

SOURCE: INFODYNAMICS LLC, MENLO PARK, CALIF.

"Using an external group to help you manage that process allows a more consistent data stream," says Hood. Plus, the third-party provider has contingency plans in place in case data is unavailable, he adds.

Other companies, like Sherwin-Williams, prefer to get their data straight from the source. Its major retail partners, including Wal-Mart Stores Inc., Kmart Corp., Target Corp., Lowes Co. and The Home Depot Inc., "have IT departments big enough to consolidate point-of-sale data, with departments to break it down," Revak says. For Sherwin-Williams, "It all ties into the relationship sales and marketing people have with their customers," he says.

In either case, Thornthwaite advises that companies find a trusted resource to own half the process and work as partners on consistency, formatting, reliability and contingency plans.

Timing is critical in Krispy Kreme's electronic billing cycle, so if data doesn't arrive, its homegrown application will identify it as missing or kick out any exceptions. The IT department can then decide whether to substitute a figure based on an average. "But usually the provider has come back and given us the data that hasn't put us outside our window," Hood says.

No matter how well planned the process, observers say there's no substitute for customer contact and having tactical detail behind census data or other information. "Data, unless you control it and generate it, may not absolutely be correct," says Hood.

Collett is a freelance writer in Sterling, Va.

Online Exclusive

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KEVIN FOGARTY

Learn to Manage Data, Not Crises

YES, IT WAS PROBABLY insensitive of me to tell a friend who was recovering from heart surgery that operating on a major organ is not only inconvenient and painful, but it's also the crudest, most temporary, most incomplete treatment for any systemic problem.

Hey, I was trying to encourage him! My point was that there is always (eventually) a more elegant alternative to radical intervention, even if it's not available to you at the moment you need it. That goes not just for medicine, but for IT as well.

In medicine, the first respoose to any serious problem is almost always surgery, at least until less-violent ways to deal with a problem are discovered. In my friend's case, that meant inserting a catheter with a balloon that was inflated to crush plaque against the walls of an artery. That's relatively low impact, considering that the alternative would have involved cracking open bis chest, but it's still kind of a Roto-Rooter approach.

OPINION

In IT, you get the same crude responses to problems like the overwhelming buildup of corporate data. The two basic approaches are to just spend endlessly on storage or to lop off huge chonks of excess data and then impose random disk limits that might keep people from doing their jobs.

There are some in-between approaches, like making storage more efficient with storage-area networks, or layering XML or other middleware on back-end databases so you only have to maintain data, not scrub and then warehoose every gigabyte individually. But those just put off dealing with an inevitable crisis — a process at which IT is quite skilled, but which is much less effective than preventing the crisis in the first place. Luckily, there are specialists who have the skills to deal with deadly data hoildop — if yoo know to call on them.

They're records and information managers, who are only now emerging from the dank warrens of accoonting and legal departments in which they developed their areane skills and ruthless attitudes toward records that have outlived their osefolness.

IT has never had any real discipline about how electronic data, spreadsheets and Word files are stored; IT pros have never been able to act in an ioformed way about the cootent or value of the data, becaose IT deals only with files, not information, accordiog to Angela Fares, corporate records and information manager at Radio Shack Corp. in Fort Worth, Texas.

Effectively managing information means knowing when it was created and why, what its valoe may be and to whom, in what mediom and for how long it shoold be maintained, and when and why it should be destroyed, according to both Fares and ARMA Internatiooal, a global information and records management association. (Its Web site, *www.arma.org*, has more information and guidelines.)

That means conducting information audits, pushing departments to define what information they want, what they want to do with it and when it will no longer be of use, Fares says. It also means that IT, legal, accoonting and records management people need to collaborate on a cohesive policy for defining and managing data, not just deciding how much money to spend on disk space.

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SNAPSHOTS

Benefits Sought

IT managers at large organizations identified the lollowing as the most important benefits they're seeking from data warehouse projects

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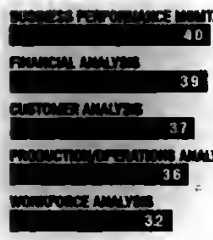

BASE: SURVEY OF 264 IT MANAGERS AT NORTH AMERICAN COMPANIES WITH 1,000 OR MORE EMPLOYEES

SOURCE: IDC, FRAMINGHAM, MASS. DECEMBER 2001

Business Headaches

The top five business challenges lor data warehouse projects in large organizations:

1. Cost
2. Executive support and company buy-in
3. Legal/regulatory and industry standards
4. Logistics
5. Staffing issues

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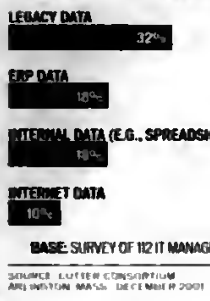
The four most difficult types of data to deal with in data warehousing projects.

PERCENTAGE OF RESPONDENTS



BASE: SURVEY OF 112 IT MANAGERS

SOURCE: EXPERT CONSORTIUM, ARLINGTON, MASS. DECEMBER 2001

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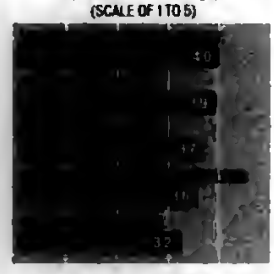

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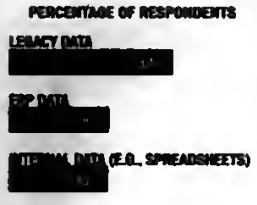

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Data's Tower o

Field Report: Data Integration

[redacted]

By Michael Meehan

Converging Tools Help a Hard Job

TECH CHECK Vendors don't brag about it, but data integration is a labor-intensive field. It doesn't matter whether you're looking at an extract, transform and load (ETL) project that brings data from a number of databases into a single data warehouse, or data mart, or at an enterprise application integration (EAI) project. In either case, users say, you must make a priority list and determine which data silo walls to tear down first to get the proper return on investment. And you had better be prepared for some hard work, too.

For organizations that can't decide whether to integrate their data at the application or database level, here's some good news: If you wait long enough, you may not have to choose. Vendors are already tying together those sorts of integration projects, and the influx of Web services tools might allow those functions to interoperate with one another.

How that will occur is anyone's guess. "I expect there to be quite a bit of merger and acquisition activity between these two spaces," says Ted Friedman, an analyst at Gartner Inc. in Stamford, Conn. "By 2004 [or] 2005, I think these two spaces will become virtually indistinguishable."

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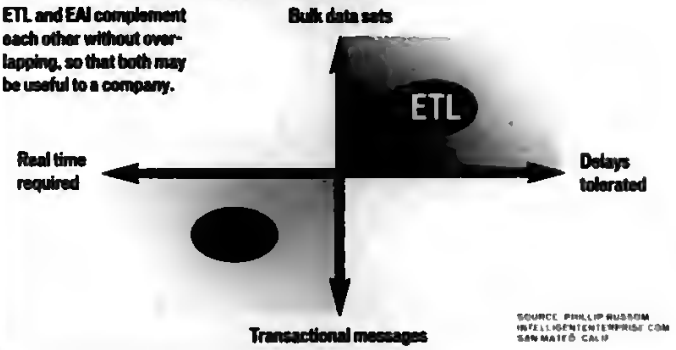

SOURCE: PHILLIP RUSSOM, INTELLIGENTENTERPRISE.COM, SAN MATEO, CALIF.

Peeling the Onion

FIELD NOTES Two years ago, Jim DeMin, technical manager at multinational corporation telecommunications and data provider Infonet Services Corp. in El Segundo, Calif., faced the task of merging six different billing systems.

Infonet chose EAI vendor SeeBeyond Technology Corp. in Monrovia, Calif., for the job. Although identifying all the information to be routed through the integration layer was difficult, DeMin says, "we probably would be spending 80% of our time doing billing interfaces without it. At least this way, we build it once, and it's integrated."

Billing wasn't the only function that needed to be integrated at Infonet. DeMin is now integrating information to feed the company's new Siebel 7 customer relationship management software from Siebel Systems Inc.

Infonet is also testing Oracle Corp.'s E-Business Suite 11i software and Cambridge, Mass.-based ChannelWave Software Inc.'s sales partner software.

"They've all got rich functionality, but that means they need a lot of data," DeMin says. "We've found every new project has an integration element to it."

Available and Scalable

One of the consequences of integration is that suddenly your systems are pushing through a lot more information.

"What we found in some cases is that one transaction can generate as much as 250 transactions in integrated environments," says Jim DeMin, technical manager at Infonet. "You need to scale your network to handle more traffic coming through your [application programming interfaces] than through your users interface."

Corporate Express replicated its ordering system Oracle database for its online customers using the SharePlex product from Quest Software Inc. in Irvine, Calif.

"When we talked about creating this integrated, Web-based environment, the first people who stood up and said there was a danger were our database administrators," says vice president for e-business services Wayne Aiello. "They wanted to make sure they had the tools to guarantee availability."

Hurwitz Group analyst Tyler McDaniel says dirty data is still the Achilles' heel of the integration market.

"We need to make sure that we're not creating easier ways of integrating bad information," he says.

A stealth player in the data integration market is Novell Inc. The company is looking to corner identity management and integration between disparate databases and applications.

As Tammy Spangler, director of IT at Idacorp Energy in Boise, Idaho, says, "It's one thing to get all your information together. It's another to figure out who can use it."

f Babel

services vendors to add capabilities.

McDaniel notes that pretty much every vendor can accomplish data translation or transformation, so users need to look for products that offer clean data, business process integration or ways of moving data in a more dynamic fashion.

The Multiheaded Monster

"This sort of thing is a multiphase project, and it's not finished by a long shot," says Mary Kay Devillier, vice president of customer support services at Richmond, Va.-based chemical company Albemarle Corp.

In late 2000, Albemarle used ActaWorks ETL platform from Mountain View, Calif.-based Acta Technology Inc. to build a data mart for an SAP AG R/3 enterprise resource planning system project. That allowed internal users to perform various analytical tasks without taxing the SAP system.

After that, Albemarle set up a real-time interface with the SAP system using Acta's EAI tools. That allowed customers to gain real-time inventory, order tracking and order history data.

Devillier says Albemarle's human resources division, which uses PeopleSoft Inc. software, and its purchasing division will be targeted for future integration projects.

"We want to be sure there's a sound business case before we sit down to do that kind of work," she says.

At CareTouch Inc. in Concord, Calif., which sells health care products and services via the Web, Chief Technology Officer Prasuna Dornadula has begun the long road to Web services integration. He plans on coding inside-the-firewall data as Simple Open Access Protocol objects.

"That will be a very good exercise for our developers, and then they'll be ready for more complex, outside-the-firewall projects in the future," he says.

Online Exclusive

Visit our site to read a Q&A with John Radko, chief architect at GE Global eXchange Services Inc., on the impact of Web services on data integration:

www.computerworld.com/q728508

Adapting to Adapters

CASE STUDY CORPORATE EXPRESS INC. Broomfield, Colo.

WHO THEY ARE: Supplies office products, furniture and computer equipment to 400,000 customers worldwide via the Web and direct sales.

GOAL: Integrate data and applications from all systems to a single order entry system.

STRATEGY: Use integration tools from webMethods Inc. in Fairfax, Va.

CHALLENGES: The vendor was able to provide about 70% of what Corporate Express needed, but its IT staff had to build the rest.

"We've got proprietary systems, and the adapters need configuration," says Wayne Aiello, vice president for e-business services. "The out-of-the-box adapter doesn't necessarily hit all the data points you need."

ISSUES: The integration tools, though powerful, were foreign to a staff used to jury-rigging integration projects with proprietary electronic data interchange channels.

"It probably took three to four months to get the basics down," Aiello says.

The staff did learn, Aiello says, and shaved the construction time for adapters from up to six weeks to as little as a day.

PAYOFF: The unified order entry system handled $5 billion in sales last year. The project has allowed Corporate Express to keep its legacy systems intact and share data without having to build a warehouse.

FUTURE PLANS: "Now we have that integration layer in place, and we can get anything new we add to share information at that layer," Aiello says.

ETL or EAI: Which One's Best?

A Shifting Landscape

COMPETITION Here's a rundown on some ETL, EAI and suite vendors and their data integration product offerings:

DATABASE-TO-APPLICATION SUITES

- **IBM:** Has considerable strength in the integration market, thanks to WebSphere platform and application server, CrossWorlds Connectors and MQ Integration Builder. Forthcoming Xperanto will be an XML/standards-based tool for data integration.
- **Oracle Corp.:** Offers a collection of enterprise integration applications, including Oracle9i Integration Server, the newer Oracle9i Database Enterprise Edition management and its E-Business Suite 11i.
- **Sybase Inc.:** It's e-Business Infrastructure line includes Adaptive Server Enterprise and Enterprise Connect Data Access plus numerous adapters to jump-start integration projects.

SUITE-SUITES

- **Sun Microsystems Inc.:** Its iPlanet line, built on open-standard Sun One Network Environment, includes iPlanet Integration Server. Also, Sun's Enterprise Data Integration Reference Architecture uses Informatica PowerCenter hosted on Solaris and Sun Enterprise servers, working with either Oracle9i Enterprise Edition or Veritas Database Edition for Oracle.
- **Microsoft Corp.:** Has SQL Server database technology and BizTalk Server, elements of the .Net platform built on XML data exchange and Simple Object Access Protocol standards.
- **Computer Associates International Inc.:** Has a wide range of integration tools, including Advantage InfoRefiner, Metadata Management and several versions of Advantage Data Transformer product. However, CAI has yet to gain much traction in this market.

ETL SYSTEMS

- **Ascential Software Inc.:** DataStage XE product family, including DataStage Connectivity, provides a wide range of data integration capabilities.
- **Acta Technology Inc.:** ActaWorks does both batch and real-time data transformations and operations between a variety of legacy systems.
- **Informatica Corp.:** Data Integration Platform has a heavy focus on analytics.
- **SAS Institute Inc.:** Data Quality Solution and Integration Technologies.
- **Ilog Software Inc.:** ETL Manager, Integration Broker and XML Transformation Engine plus hundreds of adapters and connectors that link to over 140 different applications and processes.

EAI TOOLS

- **Tibco Software Inc.:** Tibco Integration Manager plus Extensibility platform for working with XML data.
- **webMethods:** Integration Platform works with a variety of legacy systems.
- **SeeBeyond Technology Corp.:** eGate Integrator and Intelligent Adapters for database and other systems facilitate data integration projects.
- **Vitria Technology Inc.:** BusinessWare Integration Platform includes e-commerce vocabulary and process management.
- **Mercator Software Inc.:** Teamed with Oakland, Calif.-based Versata Inc. last year to build business process automation into its Mercator Integration Broker.
- **BEA Systems Inc.:** Has lagged behind others by relying on immature Java Connector Architecture standards, but BEA's WebLogic application server has a large installed base to which other vendors must link.

Data's Tower o

Field Report: Data Integration

What's in a name? Data integration can refer to a few functions. It can comprise a set of extract, transform and load (ETL) functions that gather information from databases. Or it can perform as an enterprise application integration (EAI), where applications communicate across platforms and pool data. Then again, data integration can be a Web services project, where one application can grab and manipulate data from another application.

Or it could be a combination of the three. IT departments have multiple ways to pool, share and distribute data. The question isn't whether you can break down your old data silos, but how you do it.

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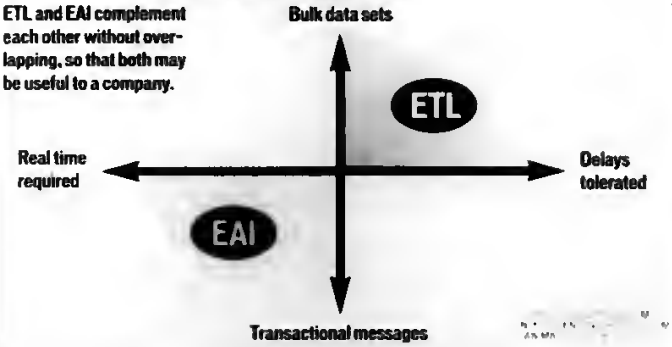

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Two years ago, Jim DeMin, technical manager at multinational corporation telecommunications and data provider Infonet Services Corp. in El Segundo, Calif., faced the task of merging six different billing systems.

Infonet chose EAI vendor SeeBeyond Technology Corp. in Monrovia, Calif., for the job. Although identifying all the information to be routed through the integration layer was difficult, DeMin says, "we probably would be spending 80% of our time doing billing interfaces without it. At least this way, we build it once, and it's integrated."

> "I refer to it as onion architecture. There's the various layers of communication and, the more you peel them off, the more you want to cry."
>
> JIM DEMIN
> TECHNICAL MANAGER
> INFONET SERVICES

Billing wasn't the only function that needed to be integrated at Infonet. DeMin is now integrating information to feed the company's new Siebel 7 customer relationship management software from Siebel Systems Inc.

Infonet is also testing Oracle Corp.'s E-Business Suite 11i software and Cambridge Mass.-based ChannelWave Software Inc.'s sales partner software.

"They've all got rich functionality, but that means they need a lot of data," DeMin says. "We've found every new project has an integration element to it."

Available and Scalable

One of the consequences of integration is that suddenly your systems are pushing through a lot more information.

"What we found in some cases is that one transaction can generate as much as 250 transactions in integrated environments," says Jim DeMin, technical manager at Infonet. "You need to scale your network to handle more traffic coming through your [application programming interfaces] than through your users interface."

Corporate Express replicated its ordering system Oracle database for its online customers using the SharePlex product from Quest Software Inc. in Irvine, Calif.

"When we talked about creating this integrated, Web-based environment, the first people who stood up and said there was a danger were our database administrators," says vice president for e-business services Wayne Aiello. "They wanted to make sure they had the tools to guarantee availability."

Hurwitz Group analyst Tyler McDaniel says dirty data is still the Achilles' heel of the integration market.

"We need to make sure that we're not creating easier ways of integrating bad information," he says.

A stealth player in the data integration market is Novell Inc. The company is looking to corner identity management and integration between disparate databases and applications.

As Tammy Spangler, director of IT at Idacorp Energy in Boise, Idaho, says, "It's one thing to get all your information together. It's another to figure out who can use it."

f Babel

services vendors to add capabilities.

McDaniel notes that pretty much every vendor can accomplish data translation or transformation, so users need to look for products that offer clean data, business process integration or ways of moving data in a more dynamic fashion.

The Multiheaded Monster

"This sort uf thing is a multiphase project, and it's not finished by a long shot," says Mary Kay Devillier, vice president of customer support services at Richmond, Va.-based chemical company Albemarle Corp.

In late 2000, Albemarle used ActaWorks ETL platform from Mountain View, Calif.-based Acta Technology Inc. to build a data mart for an SAP AG R/3 enterprise resource planning system project. That allowed internal users tu perform various analytical tasks without taxing the SAP system.

After that, Albemarle set up a real-time interface with the SAP system using Acta's EAI tools. That allowed custumers to gain real-time inventory, order tracking and order history data.

Devillier says Albemarle's human resources division, which uses PeopleSoft Inc. software, and its purchasing division will be targeted for future integration projects.

"We want to be sure there's a sound business case before we sit down to do that kind of work," she says.

At CareTouch Inc. in Concord, Calif., which sells health care products and services via the Web, Chief Technology Officer Prasuna Dornadula has begun the long road to Web services integration. He plans on coding inside-the-firewall data as Simple Open Access Protocol objects.

"That will be a very good exercise for our developers, and then they'll be ready for more complex, outside-the-firewall projects in the future," he says.

Online Exclusive

Visit our site to read a Q&A with John Radko, chief architect at GE Global eXchange Services Inc., on the impact of Web services on data integration:

Quick Link **www.computerworld.com/q?28596**

Adapting to Adapters

CASE STUDY **CORPORATE EXPRESS INC.** Broomfield, Colo.

WHO THEY ARE: Supplies office products, furniture and computer equipment to 400,000 customers worldwide via the Web and direct sales.

GOAL: Integrate data and applications from all systems to a single order entry system.

STRATEGY: Use integration tools from webMethods Inc. in Fairfax, Va.

CHALLENGES: The vendor was able to provide about 70% of what Corporate Express needed, but its IT staff had to build the rest.

"We've got proprietary systems, and the adapters need configuration," says Wayne Avello, vice president for e-business services. "The out-of-the-box adapter doesn't necessarily hit all the data points you need."

ISSUES: The integration tools, though powerful, were foreign to a staff used to jury-rigging integration projects with proprietary electronic data interchange channels.

"It probably took three to four months to get the basics down," Avello says.

The staff did learn, Avello says, and shaved the construction time for adapters from up to six weeks to as little as a day.

PAYOFF: The unified order entry system handled $5 billion in sales last year. The project has allowed Corporate Express to keep its legacy systems intact and share data without having to build a warehouse.

FUTURE PLANS: "Now we have that integration layer in place, and we can get anything new we add to share information at that layer," Avello says.

ETL or EAI: Which One's Best?

- Excel at bulk data movement
- Provide for complex transformation, aggregation from multiple sources and sophisticated business rules
- Assume considerable data delays
- Are batch-oriented, making them fast and simple for one-time projects and tests
- Offer little in the way of workflow
- Work primarily at the session layer
- Are limited in data movement capabilities
- Offer less sophisticated transformation and extraction functions
- Operate in real time
- Work better with [illegible] interacting systems
- Are workflow-oriented at the [illegible]
- Work primarily at the transport layer

A Shifting Landscape

COMPETITION **Here's a rundown on some ETL, EAI and suite vendors and their data integration product offerings:**

DATABASE-TO-APPLICATION SUITES

■ **IBM.** Has considerable strength in the integration market, thanks to WebSphere platform and application server, CrossWorlds Connectors and MQ Integration Builder. Forthcoming Xperanto will be an XML/standards-based tool for data integration.

■ **Oracle Corp.**: Offers a collection of enterprise integration applications, including Oracle8i Integration Server, the newer Oracle9i Database Enterprise Edition management and its E-Business Suite 11i.

■ **Sybase Inc.**: It's e-Business Infrastructure line includes Adaptive Server Enterprise and Enterprise Connect Data Access plus numerous adapters to jump-start integration projects.

SEMI-SUITES

■ **Sun Microsystems Inc.**: Its iPlanet line, built on open-standard Sun One Network Environment, includes iPlanet Integration Server. Also, Sun's Enterprise Data Integration Reference Architecture uses Informatica PowerCenter hosted on Solaris and Sun Enterprise servers, working with either Oracle8i Enterprise Edition or Veritas Database Edition for Oracle.

■ **Microsoft Corp.**: Has SQL Server database technology and BizTalk Server, elements of the .Net platform built on XML data exchange and Simple Object Access Protocol standards.

■ **Computer Associates International Inc.**: Has a wide range of integration tools, including Advantage InfoRefiner, Metadata Management and several versions of Advantage Data Transformer product. However, CAI has yet to gain much traction in this market.

ETL SYSTEMS

■ **Ascential Software Inc.**: DataStage XE product family, including DataStage Connectivity, provides a wide range of data integration capabilities.

■ **Acta Technology Inc.**: ActaWorks does both batch and real-time data transformations and operations between a variety of legacy systems.

■ **Informatica Corp.**: Data Integration Platform has a heavy focus on analytics.

■ **SAS Institute Inc.**: Data Quality Solution and Integration Technologies.

■ **iWay Software Inc.**: ETL Manager, Integration Broker and XML Transformation Engine plus hundreds of adapters and connectors that link to over 140 different applications and processes.

EAI TOOLS

■ **Tibco Software Inc.**: Tibco Integration Manager plus Extensibility platform for working with XML data.

■ **webMethods**: Integration Platform works with a variety of legacy systems.

■ **SeeBeyond Technology Corp.**: eGate Integrator and Intelligent Adapters for database and other systems facilitate data integration projects.

■ **Vitria Technology Inc.**: BusinessWare Integration Platform includes e-commerce vocabulary and process management.

■ **Mercator Software Inc.**: Teamed with Oakland, Calif.-based Versata Inc. last year to build business process automation into its Mercator Integration Broker.

■ **BEA Systems Inc.**: Has lagged behind others by relying on immature Java Connector Architecture standards, but BEA's WebLogic application server has a large installed base to which other vendors must link.

Extracting Dollars From Data

Experian Automotive builds new revenue streams from data extraction and integration tools. By Pimm Fox

MANY COMPANIES say they want to create new, breakthrough business opportunities from their valuable databases. Experian Automotive is actually doing it.

Experian, a unit of London-based GUS PLC, is one of the nation's largest credit reporting agencies, but it wanted to expand its business beyond credit checks for automobile loans.

If it could collect vehicle data from the nation's various motor-vehicle departments and blend that with other data, such as change-of-address records, then Experian Automotive could sell the enhanced data to a variety of customers. For example, car dealers could use the data to make sure their inventory matches local buying preferences. And toll collectors could match license plates to addresses to find motorists who sail past toll booths without paying.

But to offer new services, Experian first needed a way to extract, transfer and load data from the 51 different department of motor vehicles (DMV) systems into a single database.

That was a big challenge. "Unlike the credit industry that writes to a common format, the DMVs do not," says Ken Kauppila, vice president of IT at Experian Automotive in Costa Mesa, Calif.

Experian didn't want to replicate the hodgepodge of file formats it inherited when the project began in January 1999 — 175 formats among 18,000 files — and decided to transform and map the data to a common DB2 format.

Fortunately, off-the-shelf software tools for extracting, transforming and loading data (called ETL tools) make it economical to combine very large data repositories. Vendors offering the tools include Evolutionary Technologies International Inc. in Austin, Texas; Embarcadero Technologies Inc. in San Francisco; Oracle Corp.; Informatica Inc. in Redwood City, Calif.; and Sybase Inc. in Dublin, Calif.

ROI

Using ETI Extract from Evolutionary Technologies, Experian created a database that can incorporate vehicle information within 48 hours of its entry into any of the nation's DMV computers.

This is one of the areas in which data management software can excel, says Guy Creese, an analyst at Aberdeen Group Inc. in Boston. "It can simplify the mechanics of multiple data feeds, and it can add to data quality, making fixes possible before errors are propagated to data warehouses," he says.

New Avenue for Revenue

Using IBM's DB2 database and the extraction tool, Experian Automotive created a database that processes 175 million transactions per month and has created a variety of new revenue streams. Now, for $10.99 per query, Experian can make available via the Web the ownership history for any vehicle bought or sold in the U.S.

Car dealerships are a big market for Experian's database because they'll pay for data about vehicle ownership preferences in particular geographic areas. Each 17-digit vehicle identification number in the database contains references to model, make and color. Armed with this data, dealers can determine what kind of vehicle inventory mix might sell best in different regions.

The database — which has raised the hackles of privacy advocates [News, Jan. 21] — includes Experian's own corporate records, data from 30,000 credit granters and address-change information licensed from the U.S. Postal Service. Plus, Experian is expanding the database to include accident and emission reports, as well as information about vehicle auctions.

The result: Experian offers more comprehensive information than that maintained by state DMVs and auto manufacturers. This information could, for example, help ensure that automakers and auto parts companies are able to contact the majority of vehicle owners affected by recalls — even owners who have moved — and thereby help save lives and avert vehicular and auto parts-related injuries. Previously, recalls were initiated using dealer service and sales records.

In addition, Experian's data assets can uncover patterns useful to manufacturers and retailers in creating brand loyalty campaigns and in launching new auto models. Retailers can use the data to speed the process of providing credit to potential buyers. Auto auction companies can check the histories of millions of cars.

Experian's database is the 10th largest database in the world — now with up to 16 billion rows of data. But the company says the database is managed by just three IT professionals, thus demonstrating how efficiently the extraction tools can work with a large database to handle vast amounts of data quickly.

Online Exclusive

Find out how Foremost Insurance saved $2 million with a mobile database that replaced a flurry of paperwork. www.computerworld.com/q/128720

Quick Links

Experian Automotive

PARENT COMPANY. Experian Information Solutions Inc. in Orange, Calif., a subsidiary of London-based GUS PLC.

BUSINESS: Offers the National Vehicle Database, a catalog of more than 335 million vehicles. Applications include auto history checks, recall notifications and marketing programs. Experian's North America databases contain more than 65TB of data.

WEB SITE: www.automotive.experian.com

SOURCES: EXPERIAN.COM, HOOVERS.COM

EXPERIAN AUTOMOTIVE'S Ken Kauppila collects data from 51 DMV systems.

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DAVID HOLLENBACH

Why ROI Is So Elusive

Overbuying seats and undertraining users reduce the value of database and analytical software. By Marc L. Songini

USERS SPEND BIG BUCKS on database software and analytical tools because they're just too important to skimp on. Yet once the software is installed, it can be a real challenge to justify the cost. That's because companies get hooked into licensing schemes that don't favor their enterprises, or they buy too much capacity as a buffer against potential peak-time use. Adding to the problem is that analytical applications aren't fully exploited because end users aren't well trained on them — thus limiting the software's value.

"One can roll out an application with great intentions and lofty vision, only to be confronted with the harsh reality that other users just aren't interested," says Mike Tucker, manager of laboratory services at Brooklyn, N.Y.-based energy utility KeySpan Corp.

End users often complain that they don't have time to learn how to operate analytic applications, he says. But given the high cost of such software and the hardware to support it, it can be important to get as many users on board as possible to justify the cost.

KeySpan recently installed analysis applications from Vigilance Inc. in Sunnyvale, Calif., a project that required the utility firm to buy two Windows NT servers.

Cost-conscious companies want to know how an application will produce a return on investment at the outset, but that requires an active commitment from employees to use and exploit the software. "The application will probably not accomplish the savings on its own," says Tucker.

Figuring out whether the database or analytical software is providing payback can be a challenge, says Eric Bloom, vice president of IT at Chadds Ford, Pa.-based Endo Pharmaceuticals Holdings Inc. At his firm, market research personnel create crucial reports for executives, and databases support processes that are vital to the company — even though it's hard to judge how they affect the bottom line, Bloom says.

In general, users also have to navigate through often complex vendor pricing formulas to get the most for their money, says Frank Gillett, an analyst at Cambridge, Mass.-based Forrester Research Inc. "For instance, companies that buy database products by server CPU capacity have to buy with peak usage levels in mind, as opposed to average usage levels," he says. "That means a percentage of the database capacity usually lies untouched."

Capacity vs. Reality

The Web has exacerbated the licensing uncertainty. A company never knows when a flood of queries might come in through a Web portal, raising the risk that a mission-critical e-commerce application could crash. The result: Companies overbuy capacity just to be safe, Gillett says.

Then there are licenses where pricing is based on the number of end-user seats. At one large southern manufacturer that runs an Oracle Corp. database, it seems that there are always fewer actual users than the number of seats purchased, says a senior IT professional at the firm, who requested anonymity. Companies that purchase their licenses by user are always struggling to get the most value from their contracts.

At his shop, most licenses are based on the number of concurrent users, while newer licenses are based on the number of processors, which means that "you have to price things multiple ways to ensure you are paying the least for the particular use of the database," he says.

Oracle's user-based license agreements give customers little flexibility: licenses are issued for a given department, and they can't be shared across the company. Sometimes the manufacturer can sign a network license combining all seats into a single pool and then divvy them up, but this can be cost-prohibitive. On the other hand, when buying based on CPU capacity, a user with a less-powerful PC server may wind up paying more than a user with a mainframe or Unix box.

"The database vendors just have to recognize that their schemes can adversely affect the cost of licensing on certain platforms," says Joe Imbimbo, an Oracle applications database administrator at New York-based recruiting firm TMP Worldwide Inc.

If pricing schemes didn't favor any particular hardware platform, then "everyone will have a level playing field," he says.

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Collections of Data

BY MARC L. SONGINI

THE EXPLOSION OF e-business — and the massive amount of data it created — has made data management and organization more important than ever. We often hear the terms *database*, *data warehouse* and *data mart*, but the differences among them aren't always clear.

QUICK STUDY

Some experts say that the difference between, say, a data mart and a data warehouse is more conceptual than real. Nonetheless, here are some general rules of thumb to sort out these terms.

In the Beginning . . .

A datum is a raw piece of information that's capable of being moved and stored. In the broadest sense, a database is a collection or aggregation of such data, along with information on how pieces of data relate to one another.

A database is typically organized into records — one record per item, such as an order — that are themselves divided into several fields, with each field containing information about a specific aspect or attribute of the item. For an order, these could include customer data, part numbers, prices and discounts.

In theory, a database doesn't even require a computer, but it certainly makes its use a lot more scalable and efficient, says Mike Schiff, an analyst at Current Analysis Inc. in Sterling, Va. A pocket address book is certainly a database, but searching contact entries by city or industry requires flipping through each page.

Database management systems, such as those from Microsoft Corp., Oracle Corp. or IBM, act as the underlying vault and retrieval technology.

In addition to storing data, a database management system handles security and access control, says Schiff. Business intelligence tools then access this data for analysis. However, databases rarely exist just to run analytical operations; in general, they're vital to running a business.

Database management systems can be organized in different ways. A relational database stores information in tables and then joins or combines those tables across common fields [QuickStudy, Jan. 8, 2001]. A hierarchical database stores data in a tree structure; an order record might have every line item underneath it. An object-oriented database encapsulates both data and business logic [QuickStudy, Feb. 9, 1998].

Wholesale, Retail, Slice and Dice

Data warehouses [QuickStudy, Dec. 6, 1999] and data marts are very similar technologies, say experts, but they usually service different types of clients. For instance, a warehouse typically contains a massive amount of data from across an enterprise, says John Kopcke, chief technology officer at Hyperion Solutions Corp., a maker of analytical software in Sunnyvale, Calif.

Data marts tend to be smaller and dedicated to a single division or line of business. Data warehouses are "similar to a real food warehouse, storing massive amounts of food and then distributing subsets of food to grocery stores [the marts] for people to access [or] purchase," says Kopcke.

A data mart can run in size from megabytes to gigabytes, says Tho Nguyen, director of data warehousing strategy at SAS Institute Inc. in Cary, N.C., whereas data warehouses usually run from gigabytes to terabytes.

Consider a data mart that supports a firm's cellophane-tape division. It might contain relevant facts about making cellophane tape — suppliers, deliveries, rates, quality control information — says Schiff.

However, the uncontrolled proliferation of such data marts can become an IT nightmare unless each data mart uses standard naming and cataloging schemes and compatible data types. The last thing you want are data marts that can't talk to one another.

Users tend to assemble a warehouse from different pieces of technology, then customize it to meet their needs, rather than just put it together out of the box. Schiff notes that warehouses are often built using relational databases, because the relational model can more efficiently store and organize the huge amounts of information that make up a high-volume, multipurpose data warehouse. However, getting data from many large relational tables can require massive amounts of processing and storage.

For that kind of slice-and-dice analysis, data marts use multidimensional databases geared for quick responses with multiple elements. Often-selected data from a data mart is fed into a smaller database called a data cube for intensive processing. ▶

DEFINITIONS

- **A database** is an organized collection of information.
- **A data warehouse** is a very large database with special sets of tools to extract and cleanse data from operational systems and to analyze data.
- **A data mart** is a focused subset of a data warehouse that deals with a single area of data and is organized for quick analysis.

Related Terms

Data mining is a process that finds relationships and patterns in data [QuickStudy, March 29, 1999].

Data visualization is the graphical representation of a data collection, often in an interactive form. Modern data visualization tools present data as charts, graphs or maps and let users sort, divide and combine groups of data to help discover patterns and illustrate what they've discovered [QuickStudy, Oct. 11, 1999].

Metadata is information that describes the contents of a database. Metadata tells users when a piece of data was last updated, its format and intended uses. For example, that information can help users understand the meaning and context of financial data, customer records and business transactions [QuickStudy, Oct. 18, 1999].

Online analytical processing (OLAP) describes a class of tools that can extract multidimensional data and present it from many different points of view. Designed for managers looking to make sense of their information, OLAP structures data hierarchically. Common OLAP functions include trend analysis, drilling down to more complex levels of detail, summarization of data and data rotation for comparative viewing – in other words, slicing and dicing [QuickStudy, Nov. 30, 1998].

Repository can be another name for a database, but it can also refer to the aggregation of data into some accessible storage location, without necessarily having the ability to manipulate or extract data.

Collections of Data

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DAVID MOLESWORTH

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The Power Of Location

Does your data know where it is? By Sami Lais

YOUR DATA is operating at a disadvantage if it doesn't know where it is.

Data that's "location-aware" can quickly draw connections between customers and stores or available workers and remote job sites, for example, creating revenue streams in the process.

But as more businesses discover the value of location-aware data, they aren't turning to traditional geographic information systems (GIS). Companies are looking at new technology: spatial information management software and business support systems.

Use of this technology to add location awareness to existing data and business software is on the rise, according to an August 2001 report from IDC in Framingham, Mass. Spatial information management vendors saw sales grow 60% from 1999 to 2000, while GIS revenue grew only 2% in the same period, the report says.

"A lot more companies are incorporating geospatial information into their systems and applications, but it's always secondary, sometimes tertiary, to the main application, and that's as it should be," says David Sonnen, primary author of the IDC report.

Here's a look at four companies that are putting their data on the map.

Lais is a freelance writer in Takoma Park, Md.

Online Exclusive

Find out why more companies are geocoding their transaction data before it becomes part of a database.

Quick Link

PAC USES A LOTUS NOTES database equipped with MapInfo's MapX software to match workers to jobs based on location.

Find: The Right Worker Closest To the Job

By making its data location-aware, Producers Assistance Corp. (PAC), a Houston-based staffing service for oil and gas producers, has trimmed the time it takes to find the right employees for its customers from days to minutes. To speed searches of its Lotus database, the company turned to Troy, N.Y.-based MapInfo Corp., says Gary Dean, PAC's vice president of operations.

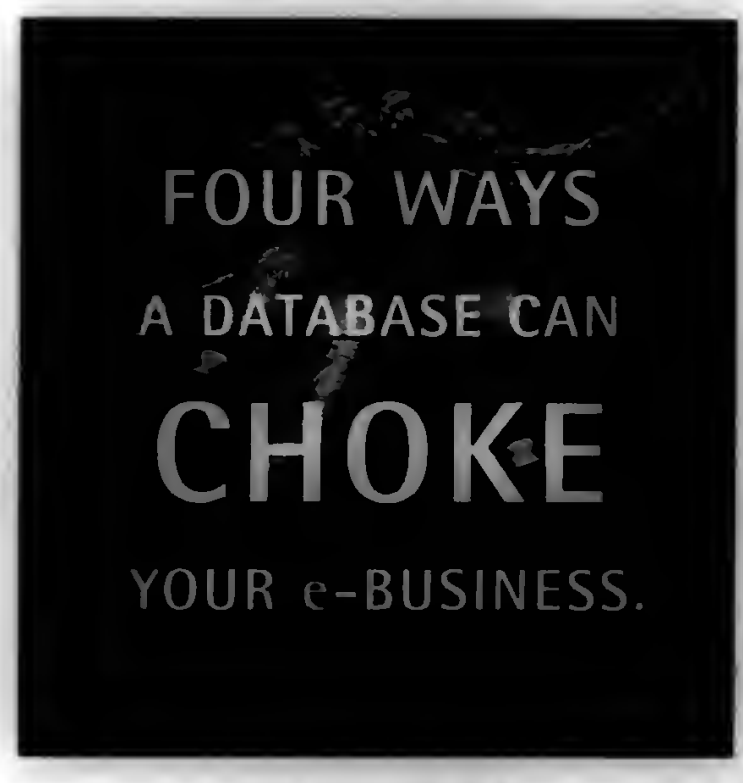
Producers Assistance Corp

Typically, when PAC had to supply workers for offshore oil operations, they would be at the job site for a week or two, so their location wasn't very important, Dean says. PAC staff could search the data-

Continued on page 50

THE STRAIGHT GOODS ON DATABASES.

FOUR WAYS A DATABASE CAN CHOKE YOUR e-BUSINESS.



DOWNTIME TIES YOU UP.

If your e-Business is constantly online, how do you handle routine DBMS chores like maintenance?

How do you add new components and resources without disrupting your current customer transactions?

Fortunately, Sybase ASE (Adaptive Server Enterprise) 12.5 answers these questions.

ASE lets you perform routine maintenance operations and even change configuration parameters while the database is online.

You can transfer users from your primary system to your backup system without missing a beat. Even if they're in the middle of a transaction. Your employees won't even know it's happening. And neither will your customers.

In case of emergency, ASE's proven cluster architecture provides fail-over to a backup server without losing any non-committed data or severing a single user connection. Bottom line: ASE delivers continuous availability to everyone who needs it, whenever and wherever they need it.

INSECURITIES BRING YOU DOWN.

ASE responds directly to your security challenges with more security features than a Secret Service detail. Including, but not limited to: protection from wiretaps, accidental disclosure and prying from thieves and vandals. Sybase ASE provides a row-level security mechanism that allows you to define how your database is accessed. It's a feature you'll find missing in most competitive products. There's also link encryption using SSL and PKI certificates. So your business is safe for business.

XML MEETS A DEAD-END.

Sybase ASE makes XML rock in ways other databases simply don't. Sybase ASE has a complete XML framework for storing, managing and retrieving XML directly to and from the database.

Data stored in the database can be retrieved as XML, allowing for easy integration of your existing information with your new Web applications.

A general XML-Query facility (XQL) allows you to easily query XML data whether it's stored in the DBMS, a flat file or even a URL. Bottom line: faster development times, faster access to the information you need.

HIDDEN COSTS BITE.

Sybase ASE puts the bite on hidden costs.

It reduces costs by the very nature of its 24x7 design. It ensures that your business never goes down. It delivers fast backup and recovery. It utilizes hardware resources efficiently. But even before you get to all of that, it saves you time and money in the traditionally costly development process.

If e-Business is going to be a critical part of your success this year, ASE has a critical role to play.

To find out more about how Sybase ASE can help you deploy and manage a successful e-Business, visit www.sybase.com/breathe or call 1-800-8-SYBASE.

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Continued from page 48

base for workers with the needed skills and simply draw from that pool.

"But then we started to see more business development inland, where workers would have to report to the same site every day," Dean says. With a pool of more than 3,000 employees, finding the right worker for what is usually a remote job site could take one or two people two or three days, he says.

After unsuccessfully trying several geocoding products, "we contemplated abandoning that feature," says John Knapp, PAC's executive vice president.

Then a PAC software developer found MapInfo's MapX. PAC embedded MapX in Lotus Notes, and now it takes one person 10 minutes to locate workers with the appropriate skills by ZIP code, Knapp says.

"Mapping is bringing our database alive," he says. "We were having a hard time getting anyone to use it as a database. Now we don't have to encourage anybody. The thing that made it so cheap [about $5,000] to add is that ZIP codes are something you already have in your database."

The time between deciding to go ahead with the implementation to delivering it to user desktops was about 45 days, Knapp says.

PAC is just beginning to calculate the return on investment, says Dean. "But it comes down to this: We don't make money if we don't fill positions, and the faster we can do it, the more money we can make," he says.

Find: Customers Near a New Location

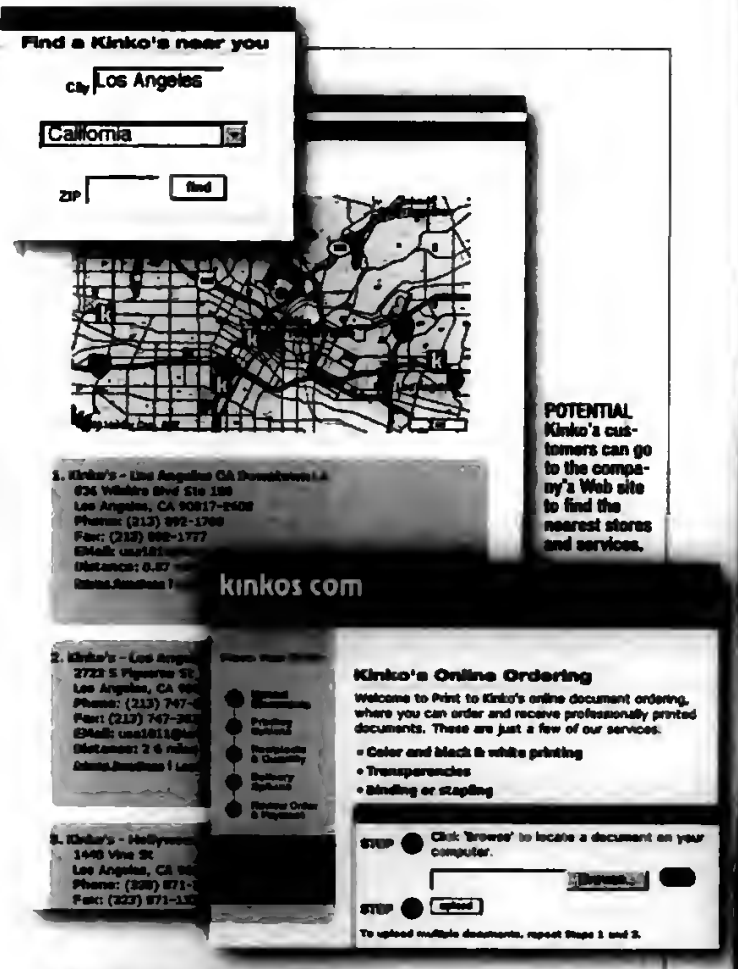
Champion Printing and Advertising Inc.

By combining insights into its customers' data and demographic information, Champion Printing and Advertising Inc. in Jackson, Mich., has grown from a small, local printing company to an operation spanning several Midwestern states.

Three years ago, the company was seeing a return of sometimes less than 2% on direct mail campaigns for its financial institution customers, says Mike Shutler, Champion's president.

By combining customer demographic data in Troy, N.Y.-based MapInfo Corp.'s TargetPro with the mapping capabilities of MapInfo Professional, Champion was able to offer better-focused mailing lists, Shutler says. "We got returns of better than 15%," he notes.

Now, when a bank picks a location for a new branch, for example, it can "come to us and say, 'Find us some business in this area,'" Shutler says. "MapInfo paid for itself within six months."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kinkos.com
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Welcome to Print to Kinko's online document ordering, where you can order and receive professionally printed documents. These are just a few of our services.
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• Transparencies
• Binding or stapling
STEP 1 Click 'Browse' to locate a document on your computer.
Browse...
STEP 2 upload

POTENTIAL Kinko's customers can go to the company's Web site to find the nearest stores and services.

Find: The Nearest Hotel And How to Get There

Each year, Atlanta-based Six Continents Hotels puts together bids to provide accommodations for corporate travelers, says Jill Cady, director of global sales operations.

In the past, customers would provide destinations for the bulk of their travel, and Six Continents would match them with the closest properties, Cady says. "But today, companies are more sophisticated about how they handle business travel," she says. "They want to give us addresses and for us to tell them which properties are close by, and they want to know the distances."

Six Continents Hotels

Figuring that out was a manual process that took days, says Cady. "Our sales staff figured out that rather than use our own directories, it was easier to go to our [external] Web site," she says. The site has a search tool that lets visitors find hotels based on location.

But the Web tool permitted only one search at a time, Cady says. So Six Continents looked to Vicinity Corp. in Sunnyvale, Calif., which had developed the hotel chain's Web tool, to allow sales staff to enter a list of addresses. Extracting the geospatial information from Six Continents' Excel data didn't require changes to the application or the data, Cady says.

That was six months ago. Today, "what used to be a tedious process that could take two days now takes maybe 10 minutes," she says. "And I have happier employees." It's more than "keeping sales coordinators from getting paper cuts," Cady adds. Factor in a decrease in staffing needs plus the time savings, "and we're looking at an absolutely terrific ROI," she says.

Find: The Store That Sells What You Need

For Dallas-based Kinko's Inc., letting customers visit its Web site to find the nearest store wasn't enough. The company needed to extend that capability to wireless phone users, says Richard Maranville, Kinko's vice president of e-commerce and field services.

But Kinko's wanted to stay focused on its core mission: selling photocopying and other business services, Maranville says, explaining, "We didn't want to have to geocode our own data."

Kinko's Inc.

Kinko's turned to Vicinity Corp. in Sunnyvale, Calif., in July 2001 for help.

Potential customers can now go to Kinko's Web site, find the nearest stores and get maps and directions. The service complements the company's online initiative, launched in December, that lets customers fill out a form, upload documents and have them printed, copied, collated and prepared.

"It was relatively painless to implement," Maranville says.

"We feed the data nightly to Vicinity, and they geocode it," says Michael Dekel, Kinko's product manager. "And as we add product lines, it'll be simple to add new attributes." The company is also considering letting stores customize their sites to advertise new or unique services. For example, a store in Los Angeles could offer special script-copying services.

"Cost avoidance is one bottom line," Dekel says. "This implementation means there are thousands of hits a day not going to our call center. We saw that traffic flatten out, and that means we can manage the calls we have coming in without hiring new staff."

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DAVID HOLLENBACH

Seeding For Data Growth

Here are five cost-conscious ways to ensure that your new data warehouse can scale up to meet business needs. By Mark Hall

EVEN 7-FOOT-1-INCH basketball player Shaquille O'Neal started small. But with an ideal genetic design and proper ongoing nourishment, he grew to become the powerful central force of a dominant organization.

Just like your data warehouse.

Corporate databases usually start small, too, but as more vital business data is poured into them — everything from customer transactions to pricing structures — they can get big quickly. And as more users query that data, the potential for a system slowdown grows. If databases aren't tuned for scalability at the design stage, relevant data could be excluded, forcing users to draw conclusions from incomplete data.

Making the right choices upfront can give a data warehouse the roots to handle dramatic growth. Here are five cost-conscious strategies to achieve scalability in a new database design.

1 KNOW YOUR BUSINESS NEEDS

The first step is to figure out what you're dealing with. "Two factors stand out: the size of the database you're starting with, and the number of users accessing it," says Phil Isensee, director of central computing at Oregon State University in Corvallis.

Isensee says it's important to know the kinds of queries users are more likely to make, because that helps you construct indexes in the database. You should also survey your application base, because some applications generate far more data than others, he says.

2 STREAMLINE YOUR DATA

After evaluating your business demands, "normalize all your data," says Mike Schmitz, a consultant at High Performance Data Warehousing in Bend, Ore.

That means that if you have 20 data warehouse sources of customer information, you should set up pointers inside those sources to replace all redundant data, such as addresses and billing codes. "Normalization buys you less redundant data, less index space, and is a key factor for growth," Schmitz says.

3 SET UP DATA PARTITIONS

Database partitioning is the next key design feature of a scalable data warehouse, says Schmitz. For example, partitions can be used to manage data in units of time. One partition can be based on one day, another on seven days and still another on 30 days, matching partitions to business operations. This approach is particularly useful for updating an existing warehouse. "When you load data into a day's partition and index it, you can update the entire warehouse in microseconds," Schmitz says.

4 CHOOSE SYSTEMS WITH POWER

The underlying technology is also critical when scalability is crucial to a data warehouse, says Dan Vesset, an analyst at IDC in Framingham, Mass. "Not every software package scales equally well," he says.

For large-scale data warehouses of up to hundreds of terabytes, Oracle Corp.'s 8i and 9i and IBM's DB2 databases are the best choices and should be run on mainframes or massive Unix servers such as Sun Microsystems Inc.'s Enterprise 10000, Schmitz says.

For maximum scalability, you'll probably adopt symmetrical multiprocessing (SMP) systems. SMP systems eclipsed massively parallel processing computers as the preferred architecture in 2000, according to Waltham, Mass.-based research firm Winter Corp., which reports that 55% of the world's largest multiterabyte databases run on SMP systems.

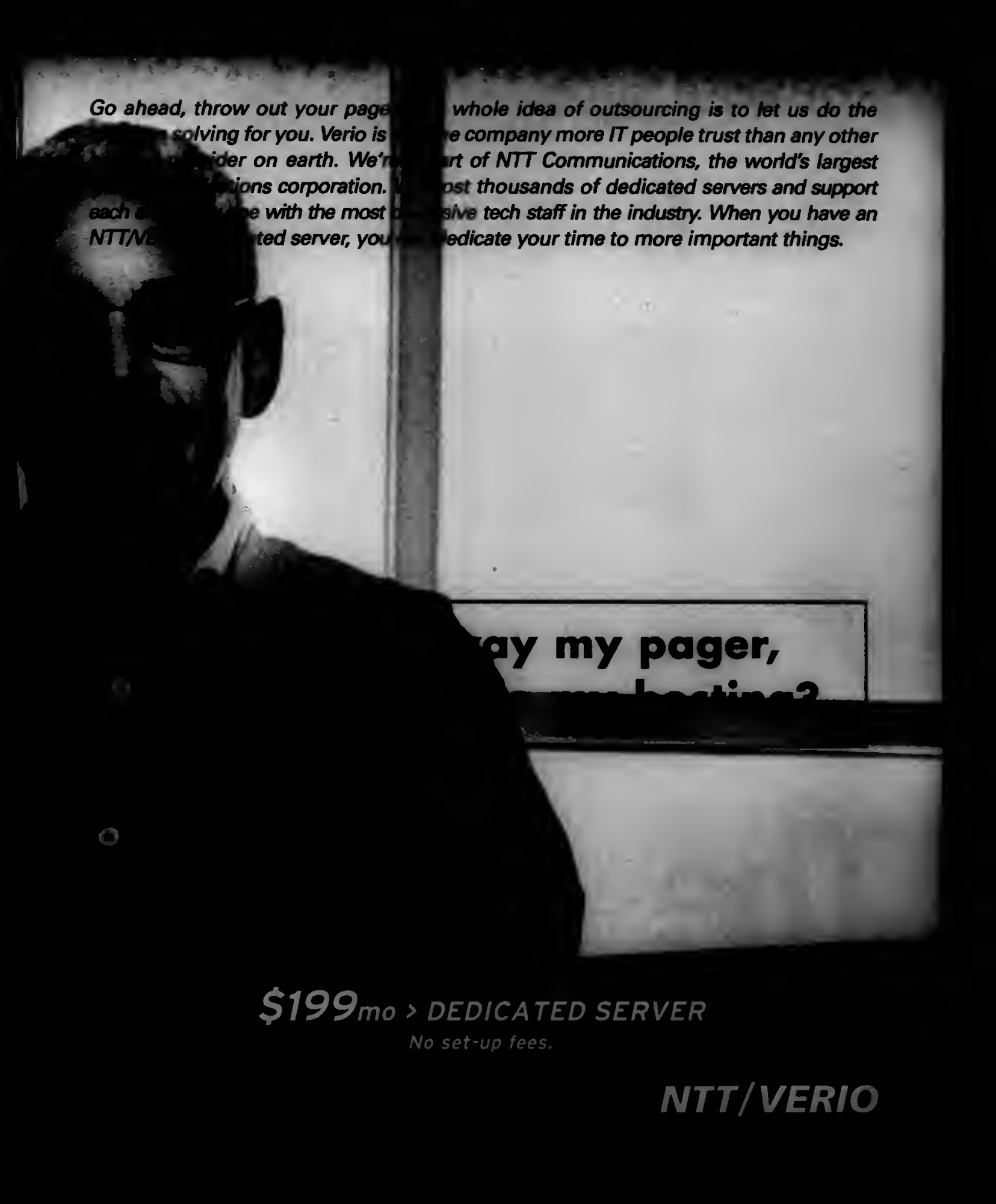
"SMP is the way to go," says Isensee. "You don't want one user's query tying up all the resources."

5 CONSIDER OUTSOURCING

Elizabeth Koehler, manager of financial planning and analysis at CBS MarketWatch.com Inc. in San Francisco, says that several years ago, her company was faced with a software upgrade to a more powerful version of its data analytics package and the increased hardware and support costs that went with it. To help control costs and keep pace with its ever-expanding data, the firm outsourced its data warehouse operations.

MarketWatch switched from Accrue Software Inc. in Fremont, Calif., to outsourcer digiMine Inc. in Bellevue, Wash., in September 2000. If it hadn't, says Koehler, she's not sure her analysts would have received their daily reports when, one year later, the financial Web site experienced all-time high traffic loads after the Sept. 11 attacks sent stock markets reeling.

Online Resources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The Search Is On

Research labs are finding smarter ways to sift and analyze huge databases. Here are four of the coolest projects. By Gary H. Anthes

RESEARCHERS are inventing better ways to find and make sense of information. Efforts to improve data mining and searching are being driven by the deluge of information in this increasingly networked world and by companies' need to respond ever faster to changes. And, sadly, the field has gotten a big boost from the terrorist attacks on the U.S. last fall.

Computerworld looked at some of this research and found companies perfecting techniques for machine learning, real-time analysis of data flows, distributed data mining and the discovery of "nonobvious" relationships.

Known Associates

Systems Research & Development (SRD) developed its Non-Obvious Relationship Awareness (NORA) technology to help casinos identify cheaters by correlating information from multiple sources about relationships and earlier transactions (see chart at right).

Las Vegas-based SRD, which received funding from the CIA, is now developing several NORA plug-ins to reach further into the world of criminals and terrorists. Last month, the company unveiled a "degrees of separation" capability that finds deeper connections among people.

"It will tell you that the Drug Enforcement Agency's agent's college roommate's ex-wife's current husband is the drug lord," says Jeff Jonas, chief technology officer at SRD. NORA can bridge up to 30 such links, he says.

The new NORA module uses streaming technology that scans data and extracts information in real time as it flows by. That would allow it to, for example, instantly discover that a man at an airline ticket counter shares a phone number with a known terrorist and then issue an alert before he can board his flight. Jonas calls it "perpetual analytics," to distinguish it from periodic queries against an occasionally updated database.

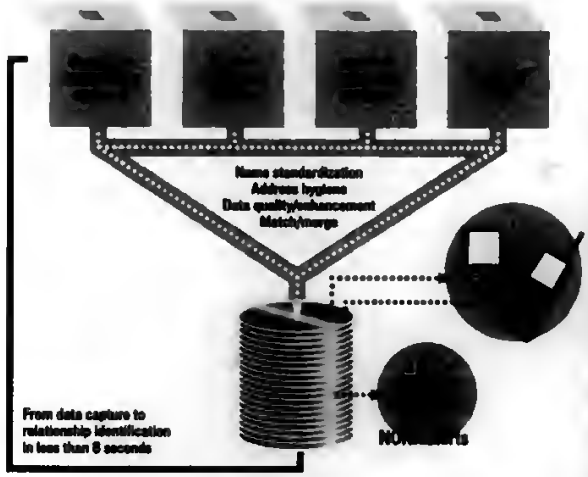
SRD is also developing the concept of "cascading" NORA data warehouses for really big problems.

For example, Jonas says, each airline might have a copy of NORA processing its passenger data and sending the summarized results to a midtier NORA system at the Federal Aviation Administration. Car rental agencies might send their NORA results to a rental car association. And the U.S. Immigration and Naturalization Service could collect data from ports of entry.

All three midtier NORA systems would then send transactions to the top-tier system at the Office of Homeland Security in Washington. They would communicate with one another in a "zero administration" arrangement in which rules and filters would determine whether a piece of information got passed up or down the chain, Jonas says.

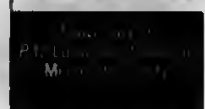
Non-Obvious Relationship Awareness (NORA)

Systems Research & Development's NORA technology can take information from disparate sources about people and their activities and find obscure, nonobvious relationships. For example, it might discover that an applicant for a job at a casino shares a telephone number with a known criminal and issue an alert to the hiring manager.



SOURCE: SYSTEMS RESEARCH & DEVELOPMENT, LAS VEGAS

Outbreak Detection



If a bioterrorist attack occurred, it would be critical for health and law enforcement officials to find out quickly, even

Continued on page 56

If you're considering business continuity, talk to the company that invented it.

In 1994, EMC Corporation understood that protecting your information was nothing less than a make-or-break proposition.

US Patent 5,544,347 brought our vision to the world in the form of the world's first business continuity software, SRDF™. Today, SRDF is part of our comprehensive offering of patented technologies, focused partnerships, and extensive expertise that helps keep your information available in the event of a disaster—and makes your business more productive every day of the year.

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The Search Is On

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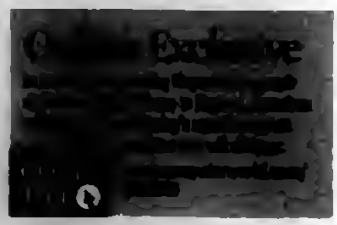
before people were diagnosed with a specific disease.

The key to doing that lies in distributed data mining, says Tom Mitchell, a computer science professor at Carnegie Mellon University in Pittsburgh. Carnegie Mellon and the University of Pittsburgh recently fielded the Real-Time Outbreak Disease and Surveillance (RODS) system, which takes data feeds from the emergency rooms of 17 local hospitals, loads it into a database and applies statistical techniques to predict the occurrence of diseases such as anthrax and smallpox. The universities also used RODS during this year's Olympic Winter Games in Salt Lake City.

The system considers 30 to 100 variables every few minutes over a large geographic area, says project co-director Andrew Moore, who is also director of the Biomedical Security Institute in Pittsburgh. "We are looking at between 1 million and 1 trillion possible strange things going on — possible indicators of various kinds of disease," says Moore. "If we are not careful, we'll use a year's worth of supercomputer time every day."

Project members are working on better algorithms and have increased processing efficiency by a factor of 10,000 in the past year, Moore says, but more improvements are needed. The system may be expanded to look at pharmacy cash-register data, school attendance records, animal sickness data, phone call records and vehicular traffic patterns, all of which may hold real-time clues about changes in a population's health.

But gathering all that information



raises privacy and confidentiality concerns. At present, the hospital data comes into a central repository where it's carefully scrubbed of information that could be used to identify anyone. Carnegie Mellon researchers are looking at ways to push that scrubbing activity out to the data source.

"How can you design a data mining system that instead of running on a central repository, allows each hospital, store and so on to keep their own records and not reveal the identities?" asks Mitchell, director of Carnegie Melloo's Center for Automated Learning and Discovery. "What you want to do is give them some software that they can use to put their own privacy restrictions on."

That concept could be applied in many domains, Mitchell says. For example, intelligence agencies could use it to allow information-sharing across departments while protecting the sources of the information, he says.

Upside Down

"Instead of archiving data and running search queries through it, we archive search queries and run data through it," says Val Jerdes, vice president for business development at Streamlogic Inc. "It's a search engine on its head."

The advantage of an inverted search engine, he claims, is that it's 6,000 times more efficient than the conventional approach. It can handle huge volumes of data that would be expensive or impossible to process using the standard method of loading data into an archive, indexing it and then retroactively querying it.

Los Altos Hills, Calif.-based Streamlogic's feed-monitoring technology "strains" the information through query rules in real time, eliminating the archival requirement entirely. A demonstration at *www.streamlogic.com* runs all the postings to some 50,000 Usenet news groups — 10 postings per second, or 2GB per day — through a database of user-specified topics and instantly sends an alert every time one of those topics appears in a post. It also turns unstructured information into data that can put into a relational database for further analysis.

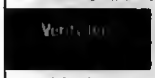
A feed-processing engine plucks out information based on user-specified topics or keywords. A feed analysis engine uses statistical techniques to analyze, categorize and summarize information for identifying trends, advertisement-targeting and other applications. The engine improves with use as it learns the most relevant words and phrases, says Streamlogic.

The future of these concepts lies in applications that others will develop with Streamlogic's tool kit, which includes a collection of "metaware" and a language similar to SQL. For example, it could be used to speed and unify the flow of data throughout an enterprise, Jerdes says.

"So when a customer's order comes in, instead of moving from one database to another in functional silos, we are able to dissolve the walls so that the order gets through to manufacturing, customer relations, financial and sales systems," he says. "And all that could happen instantaneously."

VERITY'S Raghavan: Through machine learning, a system can learn that some phrases are variants on the same theme.

What's the Answer?



When someone types the query "What is the population of the world?" into an Internet search engine, he most likely wants the numerical answer — 6.2 billion — not pointers to hundreds of documents containing the words *population* and *world*. Unfortunately, today's search engines produce more document hits than answers.

But Verity Inc. is developing software that will be a lot smarter, says Prabhakar Raghavan, chief technology officer at the Sunnyvale, Calif.-based company. The approach involves putting human learning, or rules, into the software and enabling that software to teach itself in a process called machine learning.

Suppose you want to build a recruiting system that automatically extracts information from the scanned résumés of job applicants. Raghavan says specific rules could be written into the software to indicate that employment information is commonly found after the words *employment, work history* and *experience*, enumerating every possibility. Or one could train the system by giving it an initial batch of résumés annotated as to what information appears in each area of the résumé.

"After it's looked at 50 or 100 résumés, it's started to figure out that all those phrases are variants on the same theme," Raghavan says.

Verity is using a relatively new technique called logistic regression classification to enable such machine learning. The best systems for information extraction use both hard-coded rules and machine learning, Raghavan says.

Verity is also working on software that can synthesize and summarize information. "That's difficult with an unstructured query like 'What percentage of Republicans in Santa Clara County are in favor of bombing Iraq?' " Raghavan says. It requires joining data from several sources and resolving conflicting information, and the technology to do that is still primitive, he says.

Raghavan says Verity software will be able to handle a query like the one about world population in about two years, but the capability to answer questions like the one about attacking Iraq will take considerably longer to develop. ◗

> Instead of archiving data and running search queries through it, we archive search queries and run data through it. It's a search engine on its head.
>
> VAL JERDES, VICE PRESIDENT, STREAMLOGIC

Why The Help Desk Needs All The Help It Can Get.

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The Data Designers

What you need to know to land a job and keep your skills fresh in the database management field. By Sharon Watson

Employee Spotlight

Name: MICHAEL SEAGRAVE
Title: Lead programmer/analyst
Employer: Harrah's Entertainment Inc. in Las Vegas, which owns and manages gaming establishments in the U.S.
30-second résumé: Seagrave joined the company seven years ago with a bachelor's degree in computer science and started as an AS/400 operator/administrator. After nine months, he became a programmer and was creating data reports and working with Informix Corp. products, doing design, coding and data modeling. Seagrave approached a project coordinator to join the data warehouse team. He became a lead programmer last fall and now manages programmers and business analysts on operational data store and data warehousing projects. Seagrave continues to design, model, code and work with Teradata Corp. data tools and utilities, and others.
Skills boost: "Get to see the business through your users' eyes," urges Seagrave. He attends Harrah's supervisor training where he meets a variety of Harrah's non-IT professionals, who work in everything from gaming to food services, and learns about their jobs. "I see how they use what I create," Seagrave says.

CAREERS

Seagrave also learns by doing. For a recent hot project, he revamped a cumbersome flat-file data-loading practice to an all Open Database Connectivity-driven process, enabling fast, seamless selecting and loading of data from multiple systems into the warehouse. "That took a lot of learning about utilities, the various data sources, how the data would flow," says Seagrave. "Now I'm seen as one of the experts here on Teradata."

– *Watson is a freelance writer in Chicago*

Is It Hot?

[illegible] Hot database skills including Oracle and Microsoft SQL Server, increased in value last year, averaging nearly 9% in median skills premium pay according to Foote Partners LLC in New Canaan, Conn. But some recruiters say data professionals don't have the clout they did just a few years ago.

[illegible] "Two years ago, we saw a lot of job movement, and people could name their price," says Maureen Clarry, owner of Connect: The Knowledge Network, a recruiting firm in Littleton, Colo. "Now, a lot of people are settling for jobs they would not have found attractive then because they're happy to be working."

Best Place

- Operates 21 casino/hotels with more than 6,500 rooms and 50 restaurants in 17 markets.
- Ranked No. 2 on *Computerworld*'s 2001 Best Places to Work in IT list.

2001 revenue: $3.71 billion

Harrah's Entertainment Inc.
Las Vegas

Number of IT workers: 265, about 45 in the database unit, maintaining 25 million accounts.

How it hones staff skills: Because Harrah's business is so data-driven, its data professionals challenge themselves by working closely with business users, says Monica Tyson, who oversees the data store and data warehouse as director of IT development. "We're putting data together to create knowledge for the organization," she says. "It's not just bits and bytes." To that end, when interviewing people, Harrah's looks for communications skills as much as technical skills. It also trains its data professionals in hot skills and on its database platforms, including those of NCR Corp.'s Teradata and Cognos Inc. "We look for the underlying skills, such as program design, test skills, user query support," Tyson says. "If someone has those, it's easy to train them on the technology."

Online Exclusive

Data professionals could see new skills challenges with the advent of real-time data warehousing.

Quick Link

www.computerworld.com/q?28376

Skills

- Get experience designing, modifying and working with data models.
- Become proficient with a good database interface tool, and take a course in relational database design.
- Master database utilities like scheduling and version-control languages, and be skilled in designing for programs users rely on, like Word and Excel.
- Be prepared to wear a lot of hats. Database administrators say they often also act as data designers, and data architects may act as project managers.
- **Bonus tip:** Consider adding networking skills to their portfolios.

Training

- Vendor programs and user groups provide practical knowledge about databases, database utilities; extract, transform and load functions; online transaction processing; online analytical processing, and decision-support tools.
- **Bonus pay?** Salary premiums for three database certifications are rising, according to Foote Partners. The median figure for bonus pay as a percentage of base salary is 12% for Oracle Certified Professionals, 12% for Microsoft Certified Database Administrators and 10% for IBM DB2 Universal Database Certified Solutions Experts.

Salaries

- **Market demand:** Oracle data architects make about $90,000 in total cash compensation, and Oracle database administrators make about $80,000, with another 5% to 15% in hot skill premium pay. Microsoft SQL Server skills are also hot.
- **Data architect:** Responsible for the logical and physical design and implementation of data and systems architecture for databases, warehouses and decision-support systems.
Salary: $85,000 to $110,000
- **Data modeler:** Creates and implements logical and physical data models that are the foundations for database/warehouse designs.
Salary: $70,000 to $100,000
- **Database administrator:** Largely responsible for day-to-day management and operations of database systems.
Salary: $65,000 to $85,000

SOURCES: MAUREEN CLARRY, CONNECT: THE KNOWLEDGE NETWORK, LITTLETON, COLO.; DAVID FOOTE, FOOTE PARTNERS LLC, NEW CANAAN, CONN.; WAYNE ECKERSON, THE DATA WAREHOUSING INSTITUTE, SEATTLE; MICHAEL SEAGRAVE, HARRAH'S ENTERTAINMENT; PEOPLESOFT INC., BRIDGEWATER, N.J.

The Data Designers

What you need to know to land a job and keep your skills fresh in the database management field. By Sharon Watson

Employee Spotlight

Name: MICHAEL SEAGRAVE
Title: Lead programmer/analyst
Employer: Harrah's Entertainment Inc. in Las Vegas, which owns and manages gaming establishments in the U.S.
30-second résumé: Seagrave joined the company seven years ago with a bachelor's degree in computer science and started as an AS/400 operator/administrator. After nine months, he became a programmer and was creating data reports and working with Informix Corp. products, doing design, coding and data modeling. Seagrave approached a project coordinator to join the data warehouse team. He became a lead programmer last fall and now manages programmers and business analysts on operational data store and data warehousing projects. Seagrave continues to design, model, code and work with Teradata Corp. data tools and utilities, and others.
Skills boost: "Get to see the business through your users' eyes," urges Seagrave. He attends Harrah's supervisor training, where he meets a variety of Harrah's non-IT professionals, who work in everything from gaming to food services, and learns about their jobs. "I see how they use what I create," Seagrave says.

CAREERS

Seagrave also learns by doing. For a recent hot project, he revamped a cumbersome flat-file data-loading practice to an all Open Database Connectivity-driven process, enabling fast, seamless selecting and loading of data from multiple systems into the warehouse. "That took a lot of learning about utilities, the various data sources, how the data would flow," says Seagrave. "Now I'm seen as one of the experts here on Teradata."

– Watson is a freelance writer in Chicago.

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Online Exclusive

Data professionals could use new skills challenges with the advent of real-time data warehousing.

Quick Link

www.computerworld.com/q1data

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- Be prepared to work a lot of hours. Database [illegible] say they often also act as data designers, and data architects may act as project managers.
- Bonus tip: Consider adding networking skills to their portfolios.

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NICHOLAS PETRELEY

Demise of The Disk Era

I ACQUIRED SOME YEARS of experience in database management in my former life as a programmer, more experience than I had ever hoped to get with databases. I was shooting for zero.

Be that as it may, it was because of my past experience that my sister recently asked me for help on some database issues. It was because of my distaste for databases that I daydreamed through the session. As I sifted through the mind-numbing details of her study guides, I found myself drifting into a world that could render the expertise of database administrators, data managers and countless others in the computer industry obsolete.

OPINION

Let me rewind a bit to show you how I got there. My sister joined the dark side some years ago when she got her MCSE certification. Now she's studying for her Microsoft SQL Server certification tests and needed some input from someone familiar with SQL, namely me.

I first noticed some sample test questions about what data you can and cannot restore if a hardware failure occurs during a backup. These questions test your knowledge of things like transaction logs and the significance of something called the SQL Server primary data file.

While I can see the academic value of these questions, my answer would have been, "You can restore all of the data, because anyone who cares and has half a brain will use redundant storage such as RAID 5. As a side benefit, RAID gives you better performance."

As if the word *performance* triggered a posthypnotic suggestion, my mind then drifted to emerging technologies such as InfiniBand, which should eventually eliminate database performance bottlenecks such as the PCI bus. My sister snapped me back into reality with a question about query optimization.

One of the basic ideas behind SQL is that for any given question, the database should be able to deliver an answer at the same speed, no matter how you word your SQL query. That premise is true only in the land called Perfect SQL.

In Perfect SQL, you never have to hand-optimize a SQL query. But we don't have anywhere near Perfect SQL. So it is extremely important to learn how to optimize queries manually, which is why the process is covered in detail in the SQL Server certification study guides.

On the surface, it seems like optimizing a query is more art than science. But it really all boils down to one thing: disk access. Whether you're choosing how to index data, what data to index, the page size and the size of the cache and buffers or measuring "the number of I/Os" (I/O commands to the disks), database performance is still all about disk access.

That's when it hit me. It's not just query optimization; an incredibly huge portion of computer science boils down to disk access. Why do we care about the PCI bus bottleneck? We use PCI to get to disks. Why do we care about virtual memory performance? It's limited by disk-access speed. Why do we use Dynamic Link Libraries and shared libraries? Because disks are cheaper than RAM. Why do we use RAID? Because individual disks are slow and they fail.

When you come down to it, it is truly mind-blowing how much of our economy must be devoted toward working around the performance limitations and failure rates of disk storage.

Now imagine how everything would change if nonvolatile RAM were as cheap as disk storage and as fast as today's volatile RAM. That would make disks virtually useless. At least two-thirds of what database administrators know about optimizing queries would be irrelevant.

Indeed, it would simplify every form of data management beyond belief. The change would be almost as revolutionary as if Ford announced that it had developed a cheap automobile that ran on water and had no moving parts except the axles.

Why aren't companies working harder to make this dream a reality? To my knowledge, our best efforts have produced only ferroelectric RAM, which is arguably a breakthrough in nonvolatile RAM. But it's still slower than today's RAM and far too expensive to compete with disk storage.

Considering the potential benefits of getting rid of disks, I hope we see better, and see it in my lifetime. Data management would never be the same.

SNAPSHOTS

Megatrends

BUSINESS INTELLIGENCE

■ Companies are adopting a staggering amount of disparate business intelligence (BI) technologies, adding to BI fragmentation in organizations. Most BI is implemented in departments on an as-needed basis, but there should be an overall plan.

DATA MINING

■ Better data-mining models are needed to handle ever-larger data warehouses in the 100TB range.

PREDICTIVE MODELING

■ Algorithms for predictive modeling should become more cost-effective and usable by Java and C++ programmers.

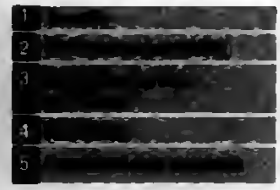
BUSINESS ACTIVITY MONITORING

■ By 2005, BI and other technologies may converge to create a market for real-time business activity monitoring, or BAM.

SOURCES: META GROUP INC. AND GARTNER INC., STAMFORD, CONN.

Technical Headaches

The top technical challenges for data warehouse projects in large organizations:



BASE: SURVEY OF 264 IT MANAGERS AT NORTH AMERICAN COMPANIES WITH 1,000 OR MORE EMPLOYEES

SOURCE: IDC, FRAMINGHAM, MASS., DECEMBER 2001

Conferences

DAMA International Symposium
APRIL 28-MAY 2, SAN ANTONIO
■ **Topics:** Metadata, XML, data modeling, data integration, business rules, data administration, objects and components, BI and data warehousing. Speakers include Ed Yourdon, Bill Inmon, John A. Zachman and Peter Aiken.
www.wilshireconferences.com

Enterprise Analytics & Data Warehousing Conference
JUNE 19-21, BOSTON
■ **Topics:** Building a better data warehouse; using BI and enterprise analytics to examine, measure and improve operations.
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FEDERAL BUREAU OF INVESTIGATION

Data Warehousing Manager

PeaceHealth, one of the nations "100 most wired" healthcare organizations with hospitals in AK, WA and OR, is seeking a Data Warehousing Manager. This new, key position will act in a lead role in furthering PeaceHealth's data warehousing efforts through application of data warehousing knowledge and experience. Will also be responsible for managing the day-to-day activities of a team to include supervisory responsibilities. This position will be located in beautiful Eugene, Oregon.

This Position will:
Lead efforts in the design and development of data warehouses.
Ensure proper and adequate management of information infrastructure including SQL Administration and database modeling.
Assist in establishing user requirements.
Lead data design, database architecture, metadata and repository creation efforts.
Prepare activity and progress reports regarding database management.
Ensure quality control of the data warehouse process.
Responsible that the integrity, availability and usability of the data warehouse.

Requires:
Prefer 3 years supervisory or project lead experience.
Data warehousing implementation experience - full life cycle.
Strong knowledge of data warehousing concepts and best practices.
Business intelligence experience with ad hoc query, reporting, and OLAP tools.
Demonstrated experience in database design - relational databases (Oracle, MS Access), and SQL.
Strong oral and written communication skills.
Bachelor's degree in MIS or Computer Science related field. Experience and/or certification can be substituted for a Bachelor's degree.

PeaceHealth offers a collaborative working environment with excellent benefits/compensation package. Please visit our web site at www.peacehealth.org to learn more about PeaceHealth. Send resume to:
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E-mail: hr-corp@peacehealth.org
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Irvine, CA 92618.
Fax: (949) 450-4958.
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IT Careers in Health Care

Large healthcare organizations are growing information technology organizations, larger than many companies. With IT employees numbering in the thousands, the healthcare groups are turning to IT professionals to develop new tools to assist physicians and healthcare professionals, improve the quality of record-keeping and availability, and automate processes that reach millions of healthcare users each day.

Among those leading the way with IT professionals is **Kaiser Permanente IT Division**, headquartered in Oakland, CA. With more than 4,000 IT employees, the **Kaiser Permanente IT Division** supports a nationwide health network and data centers designed to assist the healthcare organization's 80,000 employees and more than 8.1 million members receiving health care.

Michael Winkler, staffing marketing manager for **KP-IT**, said the division continues to implement the Clinical Information System, an effort to automate and make available online the reams of paper and images used to keep track of a patient's health and treatment. "Our goal is to get the records of a patient in the hands of doctors as quickly as possible," Winkler explains. The applications system management group is now developing Radiology Information Systems, a similar initiative to deal with radiological data and images.

KP-IT also recently announced the formation of its Internet Services Division. The organization combines KP Online, kp.org and eHealthPlan into a single unit. Internet Services will continue to develop web applications, streamline processes for getting online services to those who use them and organize services according to the way the user thinks, not the way **KP** is organized. A beta launch for members is planned for December with a full launch expected in spring 2003.

Winkler says **Kaiser Permanente** hires IT professionals, ranging from project managers and developers to senior healthcare IT experts. Opportunities exist wherever **KP** operates, but IT operations are largest in the Pasadena and Oakland areas. The healthcare provider looks for web-based development skills, database administration and design, network engineers and service and development on the backside of the business.

"Whatever the IT job is at **KP**, you'll continue to grow in your field," Winkler adds. "We have multiple projects in development, offering growth and learning. You'll be able to get your hands on a lot of different technologies. We aren't just maintaining systems; we're creating them. Our end result, in IT, is revolutionizing the way health care is delivered, that **KP-IT** is part of the healthcare team, delivering quality care to **Kaiser Permanente** members."

IDG RECRUITMENT SOLUTIONS

For more job opportunities with healthcare firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.
- Produced by Carole R. Hedden
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Server Programmer Analyst Prime Software, inc. a developer of client-server and Internet-based business application software currently seeks applicants for the following position in its Lisle, Illinois office: Senior Programmer Analyst. Applicants for this position must have a bachelor's degree in MIS, Engineering or related field plus 5 years of relevant experience in systems, application and program development using Powerbuilder, complex database programming to MS Sql Server, Sybase database. Web development experience in J2EE compliant Application Servers and JAWA would be required. Experience in working with full cycle projects conforming to SE1-CMM standards would be an advantage. For consideration, please forward resume to: Prime Software, Inc. Attention: Steve Good, 5007 Lincoln Ave., Suite 205, Lisle, IL 60532. EOE

Sr Programmer/Analyst-Business Applications (West Des Moines, IA)- Prepare appropriate documentation for assigned projects which includes detailed program specifications, codes, flow charts & other documentation. Analyze & design, system software & participate in discussions & studies aimed at selection of strategic technology & software solutions. Req'd: Master's Degree in Business Admin or Engineering or Science or Computer Science & a min. of 1 yr exp in the above job or as System Analyst. 40 hrs/wk, 8am-5pm. Please send cover ltr & resume to ADP Human Resources, MS2, P.O. Box 10984, Des Moines, IA 50306-0984 or fax to (515) 875-3009

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Programmer/Analyst. Dsgn & dvlp ETL modules, dsgn batch routines, perform data warehousing duties, performance tune modules, analyze specs & dvlp source code, test applics. BS in Comp Sci, Engg, or rel field & 3 yrs related industry exp, incl 2 yrs exp in dsgn & dvlpmt of ETL process using PL/SQL, Informatica Mappings, & Shell Scripting, & 2 yrs exp in data warehousing. Certified Oracle Prof'l DBA req'd. Send resume to Mike Davidson, Quality Consulting, Inc., 1500 NW 118th St., Des Moines, IA 50325

NW OH Metal Dec Co. seeks Network Administrator to coordinate installation of computer operating system software, test/maintain/modify software, troubleshoot, analyze performance indicators, review computer system capabilities, assist user having problems with system, and monitor computer programs. Min req: Bachelor's Degree in Mechanical Eng. or computer related field or equiv and 3 mos. in job or job related exp to include use of Visual Basic, MS-Access, SCO Unix, Microsoft Office, MAS 90/200, Photoshop and Adobe GoLive; resumes to All Folks, Inc. 4597 Van Epps Rd., Brooklyn Hts., OH 44131. No calls. EOE

Sr Systems Consultant Develop & implement computer apps./systems/networks, using UNIX and other tools. Analyze performance for Multi-CPU class servers. Develop & implement apps. for vulnerability assessment & mitigation. Masters degree in C.S., Math, Eng'g. or similar major/equiv. req'd, as well as 5 yrs exp as a Sr. Sys. Consultant or a sys. S'ware Eng'g or Comp Sys. Admin position. Prior exp. must include exp w/UNIX, using Multi-CPU servers, & w/vulnerability assessment & mitigation. Competitive salary. Resumes to Brian T. Hunt, Job #1494.06, American Trans Air, Inc., 7337 W. Washington St., Indianapolis, IN 46241-0609

JD Edwards One World XE applications and integration developers at varied levels needed to staff multiple positions. Requires 2 years experience in application development/which includes 1 o more years experience in JD Edwards One World Development. Send resumes to: Sara Lee Foods c/o Bridget Lindsay, 10151 Carver Rd., Cincinnati, OH 45242. Refer to job code BDBC.

Applications Programmer for NE OH to plan, develop, test and document computer programs and maintain application-based programs designed to automate and streamline specific functions of the Accounts Receivable process using Visual Basic, Visual C++, MS Access. Utilize PC-based technology to interact with external software applications. Must have Bachelor's Degree or equivalent. Min 3-month in-job exp. Resumes to: DDS-11, 10900 Carnegie Ave., Cleveland, OH 44195. No Calls.

InterOne Marketing is looking for computer programmers/analysts. Applicants must have BS degree with at least one-yr exp. using Oracle Designer/Developer/Applications, Siebel, Unix, SDLC, AS/400, ILE-RPG, Sequel, DB2/400. Send resumes to 880 W. Long Lake, Troy, MI 48098

Software Associates has immediate openings for System Analyst and other IT professionals. Experience with Oracle, VB, C/C++, People Tools, SQR is a plus. Please send resumes to 3318 Forest Ave., Des Moines, IA 50311. EOE.

IT Developer 3, Educant, Sacramento, CA. Assist w/ design of tech. solutions, create detailed tech. design documentation. Work directly w/ the FFELP student lending industry. Pos. reqs. 4 yrs exp. w/ Progress (3 yrs of the reqd. exp. must incl. Progress Database 7.3 or greater.) 2 yrs of the reqd. exp. must incl. developing software for UNIX Operat. System. 1 yr of reqd. exp. must incl. work w/ Progress Webspeed, SQL dvlp. & developing software for the FFELP student lending industry. 40hrs/wk, M-F. Send resume & cvr letter to Ken Holtz, 3301 C Street, Sacramento, CA 95816.

ENGINEERING. Betasphere has opening for Director of Core Technology. MS + 3 yrs exp reqd. Exp with XML, Java, ERP and ASP reqd. Resume to: BetaSphere, 1135 San Antonio Rd, Palo Alto, CA 94303. Email: jobs@betasphere.com.

Compsoft Technology Solutions Group, Inc. seeks experienced Programmer Analysts, DBAs and Software Engineers to develop and design software systems using some of the following: C, C++, VB, Oracle, Developer 2000, Java, PL/SQL, MS Access, MS SQL, internet/wireless technologies, Windows /UNIX admin for Data warehousing etc. Require BS/MS or foreign equiv. Highly competitive salaries, some travel and relocation to client sites involved. Send Resumes to: 11 N Roselle Road, Schaumburg, IL 60194

ARINC a leading provider of communications, information technology & system engineering, has an opening for a Systems Analyst at their office in Marina Del Rey, CA. The individual will seeks a Senior Software Engineer to analyzing existing computer systems as it relates to the configuration management tools and Problem Tracking System. Individual must have a Bachelor's degree in Computer Science, Management Information Systems or closely related field. For consideration, fax your resume to: (978) 649-7078. Attn: Dept #HR-WS. EOE

Semafor Technologies has multiple openings for S/W Engineers, Prog/Sys Analysts, DBAs, Proj. Mgrs and Sys Admins to design/develop/administer software applications using various development tools, languages, database/internet/wireless technologies on windows and UNIX platforms. Customize commercial business application. All positions require BS/MS or foreign equiv in Comp Sci, Math, Business, Sciences, Engg (any branch) or related field. Highly competitive salaries & benefits. Travel/relocation req. Resumes to: HR, 3300 Holcomb Bridge Rd. Ste 212, Norcross, GA 30092

COMPUTER GRAPHIC DESIGNER. Design art & copy layouts for store signs by using computers. Study illustrations & photographs to plan presentation. Determine size & arrangement of illustrative material & copy. Select style & size of type & arrange layout based on space & knowledge of layout principles. Chinese & esthetic dsgn concepts. 40 hr/wk, 9am-5pm, 2 yrs exp. req. Contact Shumai Chan, Allen Sign & Supply, 50 Delancey St, NY, NY 10002.

Systems Analyst: Design, develop & prog. software for integrated banking systems inc: teller use (loans, checking & savings acct., tellers of credit unit. Funds, based on needs if Latin America Banks & Financial Inst. Works w/IBM platform w/AS 400 system, Devp. banking prog. to interface w/the unit. 40 hrs per wk, 9A-5P, 3 yrs exp. in job offered. Fax resume to (305) 377-3282.

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Senior Software Engineer

Pitney Bowes Inc has an immediate opening in its Danbury, Connecticut office for a Senior Software Engineer

Expand the features and capabilities of the Company's product's mission critical real-time control system and is responsible for all aspects to the software development lifecycle, from requirements gathering to release.

Must possess a bachelor's degree in Computer Science, Engineering or a related field and several years of relevant work experience Experience must include OOAD and C++ under Windows NT on a large scale, multi-developer software projects. Software Analysis and design using generally accepted software engineering tools, processes and practices, industrial RTOS, multithreaded architectures, with emphasis on Industrial Automation and Control, CORBA with Client/Server Architectures, COM/DCOM/COM+, MFC, TCP/IP Sockets, OOP/OOD, Java, ActiveX Automation, Control and Containers, porting of real-time applications from Visual C++ to Java and the application of computer graphics into real-time application using Visual C++ and Java.

Resume and/or cover letter must reflect each requirement above and specify reference code MISSA to it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc , One Elmcroft Road, Stamford, CT 06926-0700

Software Engineer wanted for NJ based Co its job locs throughout the USA. Must have Master's degree in Comp Sc. Enggg. 2 yrs. of exp & proficiency in Unix, Oracle, C/C++ Respond to HR Dept., eComServer, Inc., 116-300 Village Blvd., Ste. 200 Princeton, NJ 08540 (Ref: RG81611M)

Computer Programmer

Design, develop, and test web-based software for the visualization of 3-D mechanical assemblies and 2-D drawings utilizing OOP techniques. M.S. in Computer Science, Computer Engineering or related. Must have graduate coursework in rendering and modeling and at least 6 mos. experience in the 3-D animation. 40 hrs/wk, 9-5. Send resume to: C-M Huang, VP of R&D, Alventive Inc., 700 Galleria Parkway, Ste. 400, Atlanta, GA 30339

Database Administrator sought for F/T employment by info technology co in NYC. Manage database applications and design database architecture. Use Oracle, PL-SQL, MS-SQL, MS-Access. Resumes to Enterprise 24x7 Inc., 292 Fifth Ave., 4th Floor, New York, NY 10001

Programmers, Jr Programmers, Software Engineers, Systems Admin & DBAs. Consulting Company with diverse client requirements seeks professionals in: (a) Oracle Apps-Financials, Manufacturing, HRMS, AOL & Systems Administrator. (b) Mobility apps. with Palm, mobile server Synchrnl, Smart Phones, CE, scalability/ engg. in Java and related tools-Javascript, Servlets, JDBC, Perl, CGI. C, J-Builder, WML, XML, Shell Scripts. (c) Weblogic/Websphere, Java/related tools, Oracle/related tools, C, C++, Swing, XML, RMI (d) Java/related tools, Oracle/tools, Cobol, Access, C, C++, Java Web Server, Apache Web Server; (e) Solaris, CO Open Server, Unix Ware, Unisys/AT&T Unix, NT, Netcool, Oracle DBA, C, C++, SunSparc, Netfinity, s8000 Voice IP (f) Remte Data Manager Appletree, Oracle, C, C++, COBOL, ASP, TCP/IP in VOS, Stratus XA/R320/ Continuum Mainframe, Unix, Windows, (g) SAP R/3-MM, PP, LIS, ABAP Prg Oracle, C, ASAP, Seagate, Mercator. All positions require travel to client sites. Prevailing wage/benefits. Send resume to HR, Codesoft Intl' Inc 8725 Dunwoody Pl. Ste. 8, Atlanta, GA 30350 EOE

Software Developer

Deltek Systems, Inc , a provider of enterprise-level solutions for project-oriented businesses, has an opening for a Software Developer The position includes applying engineering principles and techniques in the research, design and development of computer software for various applications. Responsibilities include analysis of software requirements to determine feasibility of design within time and cost constraints, evaluation of interface between hardware and software, and operational and performance requirements. Develop and direct software system testing procedures, programming and documentation. Consult with clients concerning maintenance of software and systems. Minimum requirements are a Bachelors Degree in Computer Engineering, Electronics Engineering, Computer Science, or the foreign equivalent and four (4) years professional experience as a Software Developer Send resume to Deltek Systems, Inc., 8280 Greensboro Drive, McLean, Virginia 22102, Attn: Human Resources. Ref: DP222

Software Engineers & Programmers. "Web enable" legacy applications to facilitate EDI, e-commerce and communication using ADABAS, Cobol, VB, FANTM, ION, VPN, ADA-SQL, ASP, Oracle and related tools. Prevailing wage & benefits. HR, Spark Technologies, 7001 Peachtree Industrial Blvd., Suite 446, Norcross, GA 30092 EOE

Sr Systems Analyst wanted by NJ based Co for job loc throughout the US. Must have Bachelor's degree to Comp. Sc. or Enggg., 4 yrs. of s/ware exp & proficiency with Windows NT, Cisco Routers, Telecom & network security protocols, VPN, SMS. Respond to: Aravav, Inc., 16 Pearl St., Ste. #205, Metuchen, NJ 08840 (Ref: GG 8045) No phone calls.

Infotabhn Technologies delivers innovative IT solutions to business clients nationwide. We have immediate full time opportunities for Software Engineer/ Programmers & Lead Analysts. We are seeking candidates with experience in design, development, implementation and maintenance of -

Post 1- web based global systems application allowing online accesses to the client's products and services. Manage & architect a solution that integrates the clients entire information system using C, XML, XSLT, JavaScript, HTML, DHTML, Java, Lotus Notes 5.0, Lotus Domino, Lotus Script & Windows NT/98. Require experience in testing, generating reports, user training and customizing of products.

Post 2- Marketing & Financial control systems and retail functionality of business applications. Experience in using OLAP tools in Data warehousing & Data Modeling, in SQL, PL/SQL, Business Objects, Web Intelligence, Oracle 8.x, TOAD & Windows 98/NT

Seeking dependable and Total Quality customer service oriented candidates (2 each) for the 2 positions. Require Bachelor's degree in Computer Science, Engineering, or related field is required + 2yrs of experience in job offered or 2yrs as a Software Developer Job involves frequent traveling as required by the project.

We offer excellent salary & benefits package for 40hrs/wk, 8:00 in 5:00p.m. Send resume to Infotabhn Technologies, 288 Walnut Street, Suite 410, Newton, MA 02460 or hr@infotahntech.com.

F/T Senior Database Consultant. Responsible for providing technical support for database administration & for updating databases & initiation of new code path policies working w/C, C++, Java, Centura, SUN SOLARIS, UNIX shell scripts, DEC UNIX, Oracle Developer & Designer 2000, Oracle RDMS, VAX/VMS & PL/SQL, SQL*Plus, & SQL Assist in developing databases for translation purposes & creating new applications to initiate new product releases to customers & database tables. Setup production environments including database creation, BSCS Oracle objects & setting BSCS environments. Install & assist w/ upgrades for in-house translation tools & provide support for translation issues regarding database or source code for the Graphical User Must have Bachelor's degree in Computer Science or any Engineering discipline. Foreign degree equivalent accepted Must have 3 yrs. exp in job offered or position w/ same duties. Send resume to Betsy Mays, Schlumberger/Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

Software Engineer: Senior Network Management. Develop carrier class Network Management Systems, including: Oracle Database Management, networking, and programming, using C, JAVA, Extensible Markup Language, Java Server Page Solaris, and Unix. Requires: Master's in Computer Science or Electrical/Mechanical Engineering or academic equivalent and 1 year experience in the job or as a Systems Analyst (Bachelors in Computer Science or Electrical/ Mechanical Engineering or academic equivalent plus 5 yrs of progressive experience acceptable.) Interview and job site in Acton, MA. 8am-5pm, 40hrs/wk, Wages: $60,000/yr Send 2 resumes to: Case # 20011542, Labor Exchange Office, 19 Staniford St. 1st Fl, Boston, MA 02114

COMPUTER PROFESSIONALS

Relycom Inc., a NJ-based computer consulting firm, is seeking computer professionals with strong technical & personal skills for multiple openings in the following positions:

- Software Engineers - To design & develop proprietary software applications client/server & networking capabilities for corporate entities. Req: MS Deg in Comp Sc & 1 yr exp either in job off'd or 1 yr exp in Software Dvlp. Must demonstrate ability in Enterprise Java with any J2EE compatible server/product & networking in UPNP/UNIX C/C++ a plus. Req: MS Deg in Comp. Sci. & 1 yr exp either in job off'd or 1 yr exp in S/ware dvlp. Must demonstrate designing capabilities using Design Patterns, UML & Rational Rose. C, C++ a plus.

- Programmer/Analysts (Sr & Jr) - To Analyze, design, develop & implement software / networking programs. Req: Bach Deg in Elect. or Comp. or S/ware Engg. & 2 yrs. exp in job off'd or 2 yrs exp in Sys/S/ware Engg field. Must be exp'd in CORBA & Multi Threading. Req: Bach Deg. in Comp. Sc & 2 yrs exp in job off'd. Must be exp'd in Perl 5.0, Tcl/Tk & Expect.

- Network Engineers - To design, configure & develop networks and Cisco CCIE lab using various Cisco Equip. Req: Bach Deg in Elect. & Comm or IT and 1 yr exp. in job off'd. Must be Cisco Cert. Network Prof s/ware: UNIX, TCP/IP MPLS, IP Enabled Frame Relay & IP Enabled ATM.

Qualified Applicants must send resumes to: President, Relycom, Inc 720 King Georges Post Road - Suite 2F School House Plaza Fords, NJ 08863

Senior Systems Analyst (MIS Storage Administrator)

Pitney Bowes Inc. has an immediate opening in its Danbury, Connecticut office for a Senior Systems Analyst (MIS Storage Administrator)

Analyze and administer the data storage systems for the Company and manage the space on a variety of storage device systems along with the utilization of magnetic tape. Responsible for the data protection and recoverability systems, as well as data access response time and storage platform implementations.

Must possess at least a bachelor's or its equivalent in Computer Science or a related field and relevant experience as a Network Administrator, in a network centric computing environment and with RAID, DASD, IBM Monitoring Systems, Tivoli, TMS, CMS, ADSM, IMS and CICS.

Resume and/or cover letter must reflect each requirement above and specify reference code MISSA or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700

F/T Intermediate Unix Systems Administrator Responsible for administering & supporting multiple SUN UNIX systems for co.'s corporate data centers. Analyze system bottlenecks, monitor & tune system(s) performance, basic shell scripting, troubleshoot defects found as well as deploy, install & configure hardware, operating & control systems, system security & recovery services. Work w/ SUN Solaris, SUN Enterprise Servers, TCP/IP, NFS, NIS & DNS. Must have Bachelor's degree in CS, Applied Sciences or related field Foreign degree equivalent accepted. Employer will accept Master's degree in lieu of Bachelor's. Must have 5 yrs. exp. in job offered or position w/ same duties. Send resume to Mary Pita, HR, R2C-022, Job Code: IMTCW, UPS, P.O. Box 833, Mahwah, NJ 07430 or mpita@ups.com.

ZEN & ART

Software Development Co. in Iselin, NJ seeks to fill multiple openings for

Project Managers

Develop Project documentation in line with the GIS Management methodology. Implement project in specified time, cost and quality. Ability to plan direct, allocate and manage staff to execute project successfully. Well versed in budgeting, WR Scope Management and Business Case Justification. Knowledgeable in MS Project and PM tool

Database Administrator

Design create, install, configure, tune, maintain and recovering large databases (Oracle, Sybase, Informix, IBM DB/2) on UNIX/ NT Knowledge of Oracle Enterprise Manager, Forms, Reports, Erwin, Replication, Oracle Parallel Server and Distributed database

System Administrator

UNIX Sys Admin with technical expertise in an IBM AIX, Sun Solaris, HP-Unix, Linux environment, support RAID and Mass Storage (SAN) products. Also experience with AIX/Veritas, disk mirroring, thorough knowledge of UNIX Shell Script, performance monitoring utilities, back up utilities, and kernel modifications

Management Systems Analyst & System Analyst,

Senior Programmer/Analyst independently performs all phases of systems development, including development planning, requirement analysis, database design and coding, testing, implementation, and documentation of applications. Act as a technical consultant to team members in the area of expertise such as Web E-Commerce, VOIP, WAP, TCP/IP and Security

Technical Specialist, Software Engineers & Programmers

The Programmer/Analyst will analyze, design, detail specification document, code, test, and debug application programs using any/multiple programming language and development environment. C, C++, VC++, Pro*C, VB, VBScript, Java, Java Script, Enterprise Java Bean, Applets / Servlets, Java Web Server, Web Sphere, Web Logic, Lotus, Lotus Notes, Active X, COM/DCOM, Active Server Pages, PERL, HTML, DHTML, XML, FrontPage, SAP SD Functional, ABAP Programming, Powerbuilder, PTC, SAP, Peoplesoft, Oracle Financial, Oracle APPS, Designer 2K and Developer 2K

All positions except Tech Specialists/Programmers require: Masters or equiv OR Bachelors or equiv in Maths, Science, Engg, Bus. Admin or Commerce with 6 months to 8 years of hands-on working experience. Tech Specialists/Programmers require 2 or more years hands-on working experience.

Candidates must be willing to travel and be a good team player. Must be able to work well without close supervision

Respond by resume to: HR Dept, Zen & Art of Client Server Computing, Inc 485 E. Rt 1 South, Ste 130, Iselin NJ 08830 Fax 732 404-0623 or email currentopenings@zenart.com.

Software Developer (multiple positions, Low Country, SC) to design, develop, code and test CAD applications in Linux, Unix and Windows operating systems by using the following skills/tools extensively: C/C++, XML, ActiveX Controls, Windows Sockets, 2D/ 3D graphic technique, Micro Station, AutoCAD, Pro-Engineer and Ideas, Parametric Modeling/ Programming, CAD database development/customization and Internet. Must have Master degree in CS, CIS or Engineering or related fields; Proficiency in AutoCAD, and Parametric Modeling/ Programming; $45K-60k/yr., 40 hrs/wk,9-5. Send resumes to Ms. Katie Crawford, DataBuilt, Inc. 1476 Fording Island Rd. Bluffton, SC 29910. Ref Code: SC-YZ2.

Staff Engineer - AMEC Technologies, a global engineering, design and technology service firm currently seeks applicants for the following position in its Decatur, GA office: Staff Engineer to develop mathematical simulation algorithms and models communication objects and protocols using OLE for Process Control (OPC) interfaces and TCP/IP. Applicants for this position must have a master's degree in Electrical Engineering, Computer Science or related field plus 5 years of job experience in development to models for simulation of pressure/flow processes in industrial systems using mathematical methods for computer simulation and object-oriented programming languages in multi-system environment and in development of OPC servers and configuration of network communication protocols based on TCP/IP For consideration, please forward your resume to AMEC Technologies, Inc Attention, Mary A Trizzino,125 Clairemont Ave., Suite 570, Decatur, GA 30030 EOE

Senior Systems Engineer needed at Brown & Williamson Tobacco Corporation in Macon, GA. Duties: Provide application and technical support its assigned area and applications. Experience using structured project management methodology, documentation and time management software. Maintain good working relationships across departments within Information Technology (IT) and with client areas. Analyze enhancement requests, design, code and test enhancements and provide effective technical troubleshooting. Work on special projects including managing projects with external vendors. Technical skills required include development experience using client server tools such as PowerBuilder, VisualBasic, Oracle Tools and C++. Must have strong understanding of Oracle and Informix relational databases and strong PL/SQL programming experience. Must have database and application design experience as well as Unix and/or Windows NT experience and an understanding of IP and Novell networks. Requires experience in laboratory automation, Laboratory Information Management Systems (LIMS), Chromatography, and Instrumentation interfacing. Experience or laboratory system validation in accordance with ISO 25 Accreditation

Must possess a Bachelor's degree in Computer Science, Engineering, Chemistry, or related discipline. Requires 5 years of experience as a Computer Programmer or Analyst. Send resume, including salary requirements to Melissa Hardin to 401 S. 4th Avenue, Ste. 200 Louisville, KY 40202-3428. Resumes without salary requirements will not be considered. No calls, faxes, or emails please! Equal Opportunity Employer.

Programmer Analyst (Micro/Web) - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of integrated client-server based systems for business, financial, banking, manufacturing and other commercial applications systems in a multi-hardware/multi-software environment using centralized or distributed relational database management systems, 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analyses, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B; or 2 of A and 1 of B; or 3 of A. A includes Oracle, Sybase, Informix, SQL Server, Progress, Ingres Access and Proxy Server and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C, Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK). High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,829 - $78,000 per year. Qualified applicants should contact or send resume to JS Supervisor, Greene County Team PA Career Link, 4 West High Street, Waynesburg, PA 15370-1324. Refer to Job Order # WEB 236575.

SENIOR PROGRAMMER/ANALYST to lead a team in the analysis, design, development, testing, implementation and support of application software for the telecommunication industry using C++, Java, Object Store, Orbix, Oracle, TCP/IP and SNMP as well as GSM and AMPS telecom protocols under HP-UX and SUN Solaris operating systems. Mentor junior programmers. Require Bachelor's degree in Computer Science, an Engineering discipline or a closely related field with two years of experience in the job offered or as a Programmer. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Ruz L. Alford, Principal, ASAP Staffing LLC, 3665 Holcomb Bridge Rd., Norcross, GA 30092. Attn: Job RU.

Programmer Analyst (Multiple Openings) Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software. Analyze science, engineering, business, and other data processing problems for application to electronic data processing systems using mainframe computer systems and related software. Work requires extensive travel and frequent relocation. Must have one year of experience using 1 of Group A and 1 of Group B and 1 of Group C or 2 of A and 1 of B or 2 of A and 1 of C as follows: Group A: DB2, IBM 3080, IBM ES9000, MVS, IMS, IDMS, Group B: CL/400, CICS, TSO, VSAM, Group C: TELON, COBOL, JCL, AS/400, RPG/400, COBOL/400. Associate a degree in one of several limited fields: computer science/applications, engineering, chemistry, mathematics or physics. Salary: $67K/YR, 40 hrs/wk. Please submit resumes to: McKeesport/Allegheny City CareerLink, ATTN: JS Supervisor, 345 Fifth Avenue, McKeesport, PA 15132-2600. Job Order No. WEB234666.

Programmer Analyst - Oracle Specialist - Multiple Openings

Structured systems analyses, design, development, testing, quality assurance, implementation, integration, maintenance and support of large volume on-line complex integrated client-server based business, financial, banking, manufacturing and other commercial application systems in a multi-hardware/multi-software environment using centralized or distributed database systems using Oracle Relational Database Management Systems (RDBMS) and related software. Design of large application systems and databases in a Co-operative Development Environment (CDE) and analyses design and development of applications using CASE (Computer Aided Software Engineering) tools. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 3 of B; or 2 of A and 2 of B. A) includes Oracle RDBMS, Oracle CASE tools (Designer, Dictionary Generator), CDE 2, Oracle Financials, B) includes PRO*C, SQL*Forms, SQL*Reporter, SQL*Plus, SQL*Menu, PL/SQL. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,829 - $78,000 per year. Qualified applicants should contact or send resume to JS Supervisor, Fayette County Team PA CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513. Refer to Job Order #WEB 235583.

Programmer Analyst (Progress/4GL Specialist) - Multiple Openings

Structured systems analyses, design, development, modification, testing, quality assurance implementation, integration, maintenance and support of large volume online complex integrated client-server based financial and human resource management applications systems in a multi-hardware/multi-software environment using centralized or distributed Relational Database Management Systems (RDBMS) such as DB2, Oracle, Sybase, SQL Server, SQL Base and related software. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Programmer Analyst/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 3 of B. A includes PeopleSoft Financials, PeopleSoft Human Resource Management and B includes PeopleTools, PeopleCode SQR, Crystal Reports, COBOL. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,829 - $78,000 per year. Qualified applicants should contact or send resume to Manager, Westmoreland County CareerLink, 300 East Hills Street, Youngwood, PA 15697-1609. Refer to Job Order # WEB 235571.

Project Manager

Seeking experienced project managers in Chicago, New York and San Francisco who are technical experts in applying formal project management tools to the full life-cycle development of large scale, OO, distributed client/server systems. Must have experience directing software development teams, with direct responsibility for scope control, staffing issues, budget maintenance and client relations. Must have a good basic understanding of distributed computing, automated testing and full life-cycle development. Must have knowledge of OO languages such as Java, Perle, Smalltalk or C++. Position requires a BS in business, finance, computer information systems or a related field or the equivalent. Please email resume to jobs@thoughtworks.com.

Senior Network Analyst Evaluate client data & voice communication requirements via multi-platform network operating systems & multi-protocol Cisco wide area network routers. Develop network strategies, designs & reviews. Implement network operating systems, messaging systems, Intranet & Internet solutions & wide area networks (WAN) via Cisco Routers to client data communication networks. Install, configure support & administrate Novell Servers. Install, configure & support Microsoft Windows NT Servers & Systems. Configure & support firewall security policies to protect client data from Internet. Configure & support network management platform to monitor network performance of Cisco local area network (LAN) switches & Cisco wide area network routers. Must have a Bachelor's degree in Computer or Electronic Engineering. Must have at least two years of experience in the job offered or at least two years of experience as a Data Communications Analyst with Microsoft Professional/Systems Engineer (MCP/MCSE) and Cisco Routers & LAN Switches certifications. Resume required. 40 hrs/wk, 8:00am - 4:30pm. Overtime pay required as needed. $58,825.52/yr. Overtime pay exempt. Central Illinois location. Applicants must show proof of legal authority to work in the U.S., including those with temporary work authorization. Send resumes to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605. Attention Sheila Lindsey. Reference # V-IL 29427-L. AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

DATABASE/SYSTEMS ADMINISTRATOR to design, install administer configure and migrate database systems in a client/server environment using RDBMS, SQL Server, Oracle, Sybase, C, TSQL and Shell on UNIX, Windows and DOS platforms. Tune databases for optimum performance and perform troubleshooting. Perform system backup and establish recovery procedures for databases. Install, configure and trouble-shoot UNIX platforms and LAN & WAN under Windows NT operating systems. Install, configure and maintain PDC, BDC, DHCP, DNS and WINS on Windows NT platforms. Require B.S. degree in Computer Science, an Engineering discipline or a closely related field with two years of experience in the job offered or as a Systems Analyst. Extensive travel on assignments to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Srinath Duddella, President, SunPlus Data Group Inc., 3783 Presidential Parkway, Suite 130, Atlanta, GA 30340. Attn: Job PA.

Information Technology

Nexgenx, a leading supplier of a new category of Internet professional services called e-Relationship solutions is seeking Technical Architects, Developers, Designers, Analysts, Project Managers, Software Engineers and Strategists in the following locations: CA, NC, NJ and Kansas City. Depending on the position, applicants must possess a Bachelor or Masters Degree and/or equivalent combination of education and/or experience and related skills.

Resumes should be submitted with cover letter referencing Ad #CW402 and Job Title for which resume is submitted to Don Loewe, 320 Commerce, Irvine, CA 92602. APPLICATIONS SUBMITTED WITHOUT REFERENCE TO AD & JOB TITLE AND LOCATION WILL NOT BE ACCEPTED. EOE M/F/D/V

LEAD PROGRAMMER/ANALYST (Columbia, SC) in design, develop, implement, integrate and support computer software for agricultural bank loan applications using C/C++, Visual Basic, Visual C++, Object Oriented design, COM, Multi-tiered Architecture, Data Modeling, SQL, Stored Procedures, MTS or COM+ and SQL Server 2000 on Windows 98/NT/2000. Req: Bach. degree (or foreign equivalent) in Computer Science, Electronics Engineering or a closely related field, with 2 yr. of exp. in the job offered or as a Programmer/Systems Analyst. Exp. must include 2 yr. using Visual Basic. Competitive salary and benefits. 8-5 M-F. Send resume to Recruiter, AgFirst Farm Credit Bank, PO Box 1499, Columbia, SC 29202. Attn: Job JK - (No Phone Calls Please)

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IT Comeback

increased the Atlanta-based IT operation's 2002 project budget from the $160 million he initially requested to more than $200 million.

That still amounts to a 17% reduction from what Delta Technology spent on IT projects two years ago, before the economy soured and the attacks took place. But Robb, who is also Delta's CIO, said business executives at the airline "gave us about $40 million more than we asked for because they had a whole list of projects that would produce payback this year."

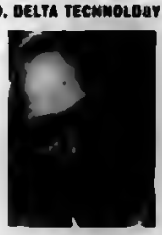
For example, Delta this month announced plans to more than triple the number of self-service check-in kiosks it operates at U.S. airports and to increase the functionality of the devices so they can be used by more travelers (see related story at right). Robb said the airline is also upgrading systems at seven of its reservation centers, four of which have already been completed.

David Zitur, CIO and senior vice president of finance at Carlson Travel Group Inc., said that the Plymouth, Minn.-based travel agency operator has cut back on some of its IT projects — a process it began even before the terrorist attacks occurred, because of the slow economy. He declined to provide specific details about Carlson's IT budget for this year.

But Zitur said Carlson is funding a series of IT upgrades at its Cruise Holidays subsidiary, which it bought out of bankruptcy last summer. For example, Carlson is adding sales analysis and customer relationship management tools to an Internet portal used by Cruise Holidays' 162 franchisees. That will give the travel agents and Carlson the ability to analyze the popularity of cruises and identify repeat customers, Zitur said.

Forrester Research Inc. last month released the results of a recent survey on technology spending plans in the travel industry. The 24 companies that responded said they increased their IT budgets by an average of 12% this year, according to Cambridge, Mass.-based Forrester. The research firm said much of that extra spending is being invested in short-term projects involving customer-facing technologies.

> [Delta] had a whole list of projects that would produce payback this year.
>
> **CURTIS ROBB, PRESIDENT AND CEO, DELTA TECHNOLOGY INC.**



"The ROI for these projects is definitely a short one," said Forrester analyst Henry Harteveldt. On average, he said, the surveyed companies reported that they expect 61% of the projects they're pursuing to pay off in one year or less. And 70% of the planned investments are expected to cost less than $1 million each, he added.

The limited number of new IT initiatives started by American Airlines Inc. so far this year have all been "convenience, security or customer-facing, ease-of-use kinds of projects," according to CIO Monte Ford.

One project that got the go-ahead is a planned relaunch of American's Web site. Fort Worth, Texas-based American is also deploying handheld wireless devices for its maintenance crews so they can access information from repair manuals without having to leave the planes, Ford said.

American declined to disclose details about its IT budget. Ford acknowledged that the airline has cut the number of projects it's working on and stretched out some existing ones since Sept. 11. "Most of what we've done is reduction in scope," he said.

Not every travel company is ready to loosen its purse strings for IT projects that aren't security-related. Eric Dean, CIO at United Air Lines Inc. in Chicago, said his company hasn't approved much new IT spending that doesn't involve passenger safety and security. United this month announced that IBM has completed implementing the first phase of a new data warehouse for the airline, but Dean said that project was budgeted more than a year ago.

Small Projects

But the situation is different at Miami-based Royal Caribbean Cruises Ltd. It put a $180 million IT infrastructure overhaul, code-named Project Leapfrog, on hold after Sept. 11. But now, CIO Tom Murphy said, the company is funding some smaller projects.

Royal Caribbean is upgrading its Web sites with new flash media capabilities, and it is spending $1.4 million on a supply chain management system upgrade that will extend the technology across the entire company, although Murphy said that project has been cut back from an original budget of $20 million.

It's still uncertain when Royal Caribbean will restore funding for Project Leapfrog. But Murphy said every IT project that does get approval has to fit into the centralized framework of Leapfrog. "We do have a restart plan," he said. ■

Airline ROI, Post-9/11

Are there specific metrics for ROI that must be met to get an IT project approved now?

<ERIC DEAN, UNITED AIR LINES>: "For ROI, I don't know what the actual [threshold] is, but it's safe to say it's very high. And there aren't many things that have been funded, so it's sort of been an academic question. There hasn't been anything that I can think of off the top of my head in the last six months that's been ROI-driven."

<MONTE FORD, AMERICAN AIRLINES>: "Of course, that's changed a little bit, since we're a lot more cash-strapped now because of the problems that the industry as a whole has had, particularly since September. Projects that have a short-term return get priority, but projects that focus on customer convenience get the most priority. Our focus now is on doing projects that are security-related and convenience-related. Everything else has a pretty tight belt to it."

New Projects Focus Spending On Customers

When it comes to funding new IT projects, many travel industry companies are putting their money where their customers are.

Web site upgrades and projects involving other customer-facing technologies are high on the IT priority lists of airlines and other travel businesses. For example, Delta Air Lines this month said it plans to install 300 new self-service kiosks in U.S. airports for use by passengers who want to check in or change flights without having to wait in line for help from a ticket agent.

The project will more than triple the number of check-in kiosks that Delta operates and expand the roster of airports where it has installed them from 30 to 80. The airline, which uses kiosks made by Lake Mary, Fla.-based Kinetics Inc., is also upgrading the devices so they can be used by any of its passengers who have electronic tickets. Now, only some of Delta's frequent fliers can use the kiosks.

American Airlines this month plans to launch a new version of its Web site with added features, including a tool that will let travelers book flights that include switches from American to one of its airline partners.

Monte Ford, American's CIO, said the scope of the Web site redesign "is very significant," although he declined to disclose the cost of the project.

Such initiatives are being driven partly by expectations of a continued rapid rise in online travel bookings. PhoCusWright Inc., a Sherman, Conn.-based market research firm, predicted in a report released in January that corporate online travel expenditures this year will increase 69%, to $14.5 billion.

– Jennifer DiSabatino

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IT Comeback

increased the Atlanta-based IT operation's 2002 project budget from the $160 million he initially requested to more than $200 million.

That still amounts to a 17% reduction from what Delta Technology spent on IT projects two years ago, before the economy soured and the attacks took place. But Robb, who is also Delta's CIO, said business executives at the airline "gave us about $40 million more than we asked for because they had a whole list of projects that would produce payback this year."

For example, Delta this month announced plans to more than triple the number of self-service check-in kiosks it operates at U.S. airports and to increase the functionality of the devices so they can be used by more travelers (see related story at right). Robb said the airline is also upgrading systems at seven of its reservation centers, four of which have already been completed.

David Zitur, CIO and senior vice president of finance at Carlson Travel Group Inc., said that the Plymouth, Minn.-based travel agency operator has cut back on some of its IT projects — a process it began even before the terrorist attacks occurred, because of the slow economy. He declined to provide specific details about Carlson's IT budget for this year.

But Zitur said Carlson is funding a series of IT upgrades at its Cruise Holidays subsidiary, which it bought out of bankruptcy last summer. For example, Carlson is adding sales analysis and customer relationship management tools to an Internet portal used by Cruise Holidays' 162 franchisees. That will give the travel agents and Carlson the ability to analyze the popularity of cruises and identify repeat customers, Zitur said.

Forrester Research Inc. last month released the results of a recent survey on technology spending plans in the travel industry. The 24 companies that responded said they increased their IT budgets by an average of 12% this year, according to Cambridge, Mass.-based Forrester. The research firm said much of that extra spending is being invested in short-term projects involving customer-facing technologies.

> [Delta] had a whole list of projects that would produce payback this year.
>
> **CURTIS ROBB, PRESIDENT AND CEO, DELTA TECHNOLOGY INC.**

"The ROI for these projects is definitely a short one," said Forrester analyst Henry Harteveldt. On average, he said, the surveyed companies reported that they expect 61% of the projects they're pursuing to pay off in one year or less. And 70% of the planned investments are expected to cost less than $1 million each, he added.

The limited number of new IT initiatives started by American Airlines Inc. so far this year have all been "convenience, security or customer-facing, ease-of-use kinds of projects," according to CIO Monte Ford.

One project that got the go-ahead is a planned relaunch of American's Web site. Fort Worth, Texas-based American is also deploying handheld wireless devices for its maintenance crews so they can access information from repair manuals without having to leave the planes, Ford said.

American declined to disclose details about its IT budget. Ford acknowledged that the airline has cut the number of projects it's working on and stretched out some existing ones since Sept. 11. "Most of what we've done is reduction in scope," he said.

Not every travel company is ready to loosen its purse strings for IT projects that aren't security-related. Eric Dean, CIO at United Air Lines Inc. in Chicago, said his company hasn't approved much new IT spending that doesn't involve passenger safety and security. United this month announced that IBM has completed implementing the first phase of a new data warehouse for the airline, but Dean said that project was budgeted more than a year ago.

Small Projects

But the situation is different at Miami-based Royal Caribbean Cruises Ltd. It put a $180 million IT infrastructure overhaul, code-named Project Leapfrog, on hold after Sept. 11. But now, CIO Tom Murphy said, the company is funding some smaller projects.

Royal Caribbean is upgrading its Web sites with new flash media capabilities, and it is spending $1.4 million on a supply chain management system upgrade that will extend the technology across the entire company, although Murphy said that project has been cut back from an original budget of $20 million.

It's still uncertain when Royal Caribbean will restore funding for Project Leapfrog. But Murphy said every IT project that does get approval has to fit into the centralized framework of Leapfrog. "We do have a restart plan," he said.

New Projects Focus Spending On Customers

When it comes to funding new IT projects, many travel industry companies are putting their money where their customers are.

Web site upgrades and projects involving other customer-facing technologies are high on the IT priority lists of airlines and other travel businesses. For example, Delta Air Lines this month said it plans to install 300 new self-service kiosks in U.S. airports for use by passengers who want to check in or change flights without having to wait in line for help from a ticket agent.

The project will more than triple the number of check-in kiosks that Delta operates and expand the roster of airports where it has installed them from 30 to 80. The airline, which uses kiosks made by Lake Mary, Fla.-based Kinetics Inc., is also upgrading the devices so they can be used by any of its passengers who have electronic tickets. Now, only some of Delta's frequent fliers can use the kiosks.

American Airlines this month plans to launch a new version of its Web site with added features, including a tool that will let travelers book flights that include switches from American to one of its airline partners.

Monte Ford, American's CIO, said the scope of the Web site redesign "is very significant," although he declined to disclose the cost of the project.

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– Jennifer DiSabatino

Airline ROI, Post-9/11

Are there specific metrics for ROI that must be met to get an IT project approved now?

<ERIC DEAN, UNITED AIR LINES: "For ROI, I don't know what the actual [threshold] is, but it's safe to say it's very high. And there aren't many things that have been funded, so it's sort of been an academic question. There hasn't been anything that I can think of off the top of my head in the last six months that's been ROI-driven."

<MONTE FORD, AMERICAN AIRLINES: "Of course, that's changed a little bit, since we're a lot more cash-strapped now because of the problems that the industry as a whole has had, particularly since September. Projects that have a short-term return get priority, but projects that focus on customer convenience get the most priority. Our focus now is on doing projects that are security-related and convenience-related. Everything else has a pretty tight belt to it."

Quick Link Visit our Web site to read a full "virtual roundtable" with three airline CIOs: www.computerworld.com/q/728522

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'At the Tone . . . '

"HEY, BOB, IT'S CARLY. It's Sunday night. Talking to Alan Miller again today. He remains very nervous about Deutsche Bank and Northern Trust, given what he's hearing and what he's seeing. Alan is feeling like you need a definite answer from the vice chairman, and if it's the wrong one, we have to swing into action. So we'll probably have to get on the phone first thing Monday morning. So, if you would take Deutsche Bank, I'll take Northern Trust, get on the phone and see what we can get, but we may have to do something extraordinary for those two to bring 'em over the line here. OK? Thanks! Hope you had a great weekend, and I'll talk to you tomorrow. Bye." ***Beep!***

"Steve, this is Bill. I was thinking about that Bazzullo guy. He's just not working out as president or whatever we've got him doing. I mean, he thinks he's really supposed to be president. He's so random, he doesn't get the joke. Is there some way we can ditch this guy? Later." *Beep!*

"Sam, Lou here. One of John's people down in finance put together a great April Fools' gag press release. The headline says, 'Gerstner leaves, earnings to drop 30%.' Funny stuff. I copied you on it, but just make sure nobody down in media relations gets a look at it. Those guys have no sense of humor — they'll just send it out as news." *Beep!*

"Bill, Steve. Hey, I got one for you — we can leak a presentation that says we're going to disable every copy of Office a year after it's installed. After that, all it would do is let you read and print out documents unless you pay for a subscription. And then we don't ever actually deny it, see? So no matter how buggy Office is, people will just be glad it still works at all!" *Beep!*

"Yeah, David Duncan, this is your buddy at Enron. Son, we're havin' a little party, seein' as this may be the last chance to do any celebratin' before the feds start diggin' around in the books. We'll bring the Texas-style barbecue, and what we want you boys to bring is the confetti. Lots and lots of confetti, if you get my drift. Are we on the same page? Be talkin' to you, son." *Beep!*

"Steve, Bill again. You know that deal we have with Unisys for that Getoutofunix.com Web site? What if we did it on Unix? Not Linux, that other one nobody uses, FreeBVD. These mainframe guys aren't technical enough to know the difference. But when it crashes, we can blame it on the fact that it's Unix. Cool, huh?" *Beep!*

"Mike, this is Fritz Hollings. I thought you showbiz guys told me no one would have any complaints about this copy protection law. Now I come to find out every lobbyist on the Hill thinks I'm fixing to destroy the PC industry. I may not know technology, but I know what an ugly mob looks like. Talk to me." *Beep!*

"Bill, Steve — I just thought of this. Everybody's going crazy about security, right? So what we do is, we tell everybody security is now Job One for us — and then we blame everything on security. Security is why the products aren't compatible, security is why the customers have to upgrade, security is why we can't comply with the consent decree, security is why you can't testify or give any more video depositions. It's great! And if they want us to give them proof, we tell them we can't — because of security!" *Beep!*

"Carly, it's Walter again. You know, I just had my people check — we got more publicity from that catfight in the run-up to the vote than HP has had for all the product launches since you came on board. Here's my idea: I know we thought we couldn't stretch this out any longer now that the vote is over, but why not? All we need to keep it going is something we can leak out on the Internet, like a recording that makes it sound like you rigged the vote. Do you have anything like that? Call me." *Beeeeeeep!*

SHARK TANK

SEVERAL rounds of layoffs have cut IT staff to the bone, says pilot fish who has survived. But in the latest purge, the IT manager got the chop too, so it's a board member who delivers the "kill list" of those whose access needs to be cut off. "The one IT staffer laid off?" says fish. "The network admin who handles all access rights to computer accounts, phones and door security cards."

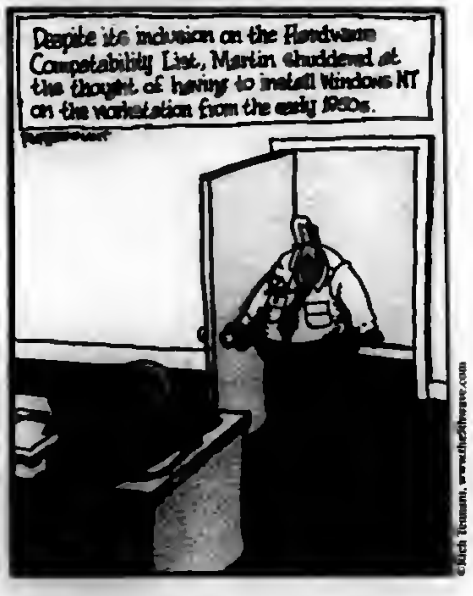
IT SHOP is moving to new quarters, and to cut downtime, one tech decides to move one tall rolling rack full of servers to the new digs himself at 6:30 a.m. At 8:30 a.m., IT pilot fish arrives to find the place in an uproar and water everywhere. "The tech said he was looking out for exit signs and clocks," fish says, "but he missed the sprinklers overhead." Or, more accurately, *didn't* miss them – and when the rack sheared off the sprinkler heads, water rained down for 45 minutes before tech found the right person to shut them off.

COUNTY HR manager asks consultant pilot fish to create electronic employment forms that can be e-mailed to departments for data and signatures to cut the need for paper copies. And when fish demos the system – complete with audit trails and electronic signature authentication – HR manager loves it. There's just one more thing all 11 departments want, he says: a "Print Form" option so they all can have paper copies.

PROBLEM with this antiquated health care database is that it won't let users "disenroll" a head of household while leaving the rest of the family enrolled, says pilot fish who uses it. Workaround is to insert "dummy" in the first-name field for the head-of-household record. Which works fine until someone uses the database to generate notices to households, says fish: "Quite a few complained after being addressed as 'Dear Dummy.' "

Try "Dear Sharky": **sharky@computerworld.com.** You get a snazzy Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky.*

The 5th Wave


Despite its inclusion on the Hardware Compatability List, Martin shuddered at the thought of having to install Windows NT on the workstation from the early 1980s.
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